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RETROSPECT OF MEDICINE:

BEING

A HALF-YEARLY JOURNAL,

CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES.

EDITED BY

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VOL. XXIV. JULY—DECEMBER,

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PRACTICAL MEDICINE.

&c., &c.

DISEASES AFFECTING THE SYSTEM GENERALLY.

ART. 1.—ON THE DIAGNOSIS OF FEVERS.

[The investigations which have been carried on within the last few years, have led physicians to consider that the symptoms and post-mortem lesions of continued fever are not attributable to any variations in its character, but to the presence of two or three diseases allied as to community of character, but separated by peculiar and distinctive marks, and which being mixed up in various proportions, give to each epidemic a peculiarity according to the predominance of the existing disease. We must first examine whether this disease (continued fever) can be separated from the affections with which it has so far been confounded. The disease here alluded to has received many names, as "Seven day Fever," "Bilious Remittent Fever," the "Mild Yellow Fever," &c. Perhaps as good a name as any, as indicating the main feature, is the one generally used, viz., the "Relapsing Fever." Let us select the main symptoms, suggesting the fundamental differences between this and other fevers.]

Relapsing Fever affects all ages and both sexes, and perhaps in an equal ratio.—In its onset there does not appear to be anything distinctive, unless the suddenness of the accession, and the severity of the early muscular and articular pains, lead to a suspicion of the real affection. But after two or three days, the symptoms, although not absolutely distinctive, become more marked; the feverishness is considerable; the muscular pains and headache severe; and on the second or third day there are, for the most part, more or less severe pain and tenderness about the epigastrium, and vomiting; there is, however, no other abdominal tenderness, and diarrhœa is generally absent. The heat of skin is alternated both with rigors and sweating, so that the resemblance to an irregular intermittent has been noted by several writers. On the third or fourth day, the symptoms are at their height; and a typical case, that is a case presenting the main diagnostic symptoms, and no others, can be generally known by the slightness of the head-symptoms, the chief being headache, and in a small proportion of cases, (about 8 per cent,) delirium, by the absence of chest-symptoms, and by the presence of epigastric and splenic tenderness, and vomiting, engrafted on a severe pyrexial state; that is to

say, a state characterised by great restlessness and sleeplessness, a hot skin, the temperature of which may rise to 107°, a white tongue, thirst, and a pulse which is seldom below 100, in more than half the cases more than 120, and in a considerable number is still higher than this, yet whose rapidity and sharpness are not indicative of commensurate danger. In a certain number of cases, as more particularly noticed below, on the third or fourth day, a peculiar tint of skin becomes perceptible; to use Dr. Cormack's expression, there is a slight "bronzing," which is most marked in the face; this appears to be the commencement of an approaching attack of jaundice, which becomes more fully declared on the fifth or sixth day of disease; the vomiting is now often severe, the matters vomited being bilious, or sometimes even coffee-ground like, or being absolutely like the black vomit of yellow fever. This jaundice is not attributable to any obstruction in the ductus communis choledochus, as bile passes freely, and even copiously, with the stools, and as after death the gall-duct is pervious. In these yellow cases there is generally tenderness over the liver, which may be also enlarged. The spleen is also often enlarged. If the patient be now bled, the blood is often buffed, and the serum is sometimes yellow, sometimes unusually green.

A day or two after this, when every symptom appears hourly becoming graver, when the restlessness and general distress have reached their highest point, there ensues, in the majority of cases, though not in all, a most remarkable series of symptoms, followed by as remarkable an intermission of all symptoms, and an apparent restoration to health. This period has received the name of "Crisis," although it would have been very desirable if some other term than this, to which so many meanings have been given, had been chosen. For the most part, at this period, the patient falls into a profuse sweat, which lasts sometimes for thirty or thirty-six hours, but is usually shorter than this. The chemical qualities of this sweat have not yet been determined; but it has, like the partial sweats which have previously occurred, a very sour and peculiar smell. When the sweat has passed off, an extraordinary change is found to have taken place; the hot skin has become cool; the quick and strong pulse is feeble and slow; the feelings of distress and discomfort have disappeared; and in severe cases are succeeded by a state of excessive languor and feebleness, as if the person had been reduced by some immense hemorrhage. After rallying from this, perfect convalescence seems to have commenced, and the yellow tinge begins to disappear, and in four or five days may have altogether vanished. This so called "crisis" is not always accompanied by sweating, a discharge of some other kind may occur in its place, such as diarrhœa, epistaxis, diuresis, or even sometimes menorrhagia.

There seems no doubt that this apparent end of the disease may be the actual one; but in a certain number of cases another phase occurs. After six or seven days of improvement, and (taking the mean) on the thirteenth, fourteenth, or fifteenth day of the disease, the fever suddenly returns. This second attack, the so called "*relapse*," exactly resembles, except it may be in point of severity, the primary attack; the shivering, the severe muscular and articular pains, the restlessness, discomfort, and sleeplessness, the burning skin, the rapid pulse, present

themselves over again. If jaundice has not been present in the first accession, it may appear on the second or third day of the second accession. After four or five days, the symptoms begin to improve, the feverishness abates, and about the twentieth day of the disease, the patient is really convalescent. In an uncertain number of cases, this second accession is terminated by a "crisis" similar to that of the first.

The disease may thus terminate, either gradually or suddenly, and in the greater number of cases it does really so end. In some cases, however, the second accession is not only terminated by a crisis, but this crisis is succeeded at an interval of four or five days by another accession, which may again be followed by crisis, intermission, and a fourth accession. No less than five of these accessions, or *relapses*, have been known to occur.

Various sequences follow this fever, of which the most remarkable are a form of ophthalmitis, (well described by Mackenzie,) rheumatic-like pains, parotitis, (which may also occur during the fever,) anasarca, and furunculi.

The disease, whose main features we have thus imperfectly indicated, although comparatively unknown ten years ago, has been so attentively studied by British practitioners, that we are, perhaps, better able to determine the mode of succession and the variation in the symptoms, by means of numerical analysis, than in the case of any other fever.

[With regard to the mortality, it is stated that in uncomplicated cases scarcely any die. Sudden collapse may come on, and in some severe cases the patient dies from ureal poisoning. In other cases, complications, thoracic or abdominal, lead to a fatal result. In 1843, the fatal cases averaged from 2 to 6 per cent. In 1847, 6·38 per cent. A very marked feature in relapsing fever is the frequency of abortion in pregnant women, though this is not invariable.]

The post mortem appearances in this fever need be described no farther than to say, that although in many cases there is congestion of, and in some instances extravasation of blood into and beneath, the mucous membrane of the stomach, and in a less degree of the intestines, yet Peyer's patches remain without deposition and ulceration. The spleen is generally enlarged, and according to Jenner, this occurs more frequently and to a greater extent than in any other form of fever. Robertson observed also some kind of deposit in the spleen, which he could not identify with the typhoid exudation, but which, like it, underwent a process of softening.

This detail of symptoms must be sufficient to convince any one of the difference between this and other forms of fever. To take only the most striking symptom, the relapse, it appears that this is hardly known except in this disease. In "many hundred" cases (1600 to 2000) of typhus, Henderson has never known a relapse; and Jenner, in his extensive field of operation, has also never yet seen such an occurrence in typhus. In the fever, or variety of fever, termed typhoid, or Dothinenteritis, relapse, as noted by Stewart and Jenner, will occur, but it is exceedingly rare. The majority of the so called relapses, in typhus and typhoid fevers, are simply sudden superventions of some complication, or

a sudden exacerbation of some previously existing complication, as pneumonia, pleurisy, &c. In 1145 cases of typhus, treated by Perry, in Glasgow, there were nineteen of these so called relapses, which were all traced to some local inflammatory action. But putting the relapse aside, the course of the remaining symptoms is completely dissimilar to that of other fevers; and the absence of the cutaneous eruptions common to other forms, is also a strong proof of their non-identity. When to these facts we add the invariable absence of the anatomical sign of Dothinenteritis, viz., the affection of Peyer's patches, the argument against the identity of relapsing fever, and the disease described by Louis, becomes almost absolute; and though the anatomical signs of exanthematic typhus are not so definite, still there are perceptible differences in this case also.

It is therefore not surprising, that the Scotch physicians, who have described the epidemics of 1843 and 1847, should have so unanimously decided on the specific nature of this fever; and the evidence in favour of this view will, we think, appear to every one sufficiently exact.

But, in addition, another most convincing argument in favour of the same opinion has been recently brought forward by Dr. Jenner, which proves that cases of other forms of fever do not give rise to relapsing fever, and that exposure to relapsing fever gives rise only to a similar disease, and not to another form of fever.

Before passing from the subject of relapsing fever, we may remark, that it can probably return several times in the same subject, and even at intervals of some few months only. In this, also, it shows a remarkable variation from the other English fevers.

Relapsing fever appears to predispose to typhus fever, and to be also predisposed to, by typhus. Steele remarks, indeed, that patients who had formerly suffered from typhus, "enjoyed an immunity from this disease;" but this is contrary to the direct and positive evidence of many other observers.

Contagion, in some instances at least, is admitted by all, except Dr. Craigie, who thinks that "although it is, perhaps, contagious, this is rather a presumption than a well-founded inference." The observations of Douglas and Jenner, however, seem conclusive on this point.

Like other fevers, this disease is influenced in an extraordinary degree by the sanitary condition of the population attacked by it. This has been traced out in Glasgow, with care, by David Smith. Wardell says, this fever "was importantly connected with destitution."

Having thus separated Relapsing Fever from the disease, which it has been customary, in this country, of late years, to call "continued fever." and having shewn that the opinion of those who have considered it "a fever, *sui generis*," is justified by its strongly-marked and peculiar symptoms, by its post-mortem characters, and by its not arising (as more fully explained elsewhere) from the causes of the other continued fevers, we are prepared to enter on a further inquiry, the object of which we may present in the following question:—

II. *Is the disease, which, with relapsing fever occasionally added to it, formed the affection termed in this country "continued fever," a single disease, or have two or more affections been included here also under a single term?*

[Dr. Jenner entered systematically into this inquiry in the London Fever Hospital. It has been long known here,-that cases of fever will deposit in and under Peyer's patches, and in the mensenteric glands, were common; and so were cases of fever without any trace of this deposit. Dr. Jenner patiently accumulated nearly 2000 accurate reports. He first separated the cases of relapsing fever, and then instituted a rigorous comparison of the rest.]

It is necessary, however, to state his method more fully, as it appears to us the only one which can possibly solve the question, and it is a model of close observation and logical induction. From the great number of histories of fever-patients he possessed, he selected the fatal cases which had been examined, and the diagnosis of which, therefore, had been confirmed. He found that he had sixty-six such cases and post-mortem examinations. Of these sixty-six, twenty-three had the intestinal and mesenteric lesion, which Louis says is the anatomical sign of typhoid fever, and forty-three were without this apppearance. Now, if Louis' doctrine be correct, that no case is typhoid fever unless it presents this appearance, it was to be seen, whether the forty-three cases in which the intestinal lesion did not occur, differed so much in symptoms and other post-mortem appearances, from those in which it did occur, as to render it impossible to suppose that they were the same disease; or whether, contrary to Louis' opinion, the symptoms were so similar as to lead to the belief that the presence or absence of intestinal lesion was a matter of little consequence. Accordingly Dr. Jenner took these two groups and compared them throughout, and found that while the symptoms and post-mortem appearances of the twenty-three cases were exactly the same as those described by Louis in his great work, the symptoms and post-mortem appearances of the other forty-three cases were entirely different, so different, indeed, as to render their separation from the other cases a matter of absolute necessity, if any certainty was to be introduced into the description of these diseases, and into their treatment. The disease which affected the twenty-three patients, he called after Louis, typhoid fever, and to the other affection he gave the name of typhus. Between these two diseases, no transition forms could be observed. The results arrived at by Jenner agree remarkably with those of Gerhard, Stewart, and others.

If we collate the chief works which have been written on the two diseases by those who have had a full persuasion of their distinctness, we find that typhus and typhoid fevers are said to differ:

1. In the *age* of the patients they affect. Typhus affects all ages, young and old; typhoid, chiefly persons under forty; it will affect older persons, but with difficulty.

2. In their *modes of attack*. Typhus being sudden, typhoid insidious, as a general rule.

3. In their *duration*. Typhus fever is of much shorter duration than typhoid, as has been noted by Gerhard, Stewart, and Jenner. The average duration of Jenner's fatal cases of typhus was fourteen days; of Reid's (143 cases) thirteen days; of the typhoid cases, twenty-two days. In the cases of recovery the difference is just as well marked. The average of 255 typhoid cases noticed by Jackson in Massachusetts was

twenty-two days. Hale's average, in the same locality, was thirty-nine days. Jenner's average is from twenty-one to thirty days. The average of non-fatal cases of typhus appears to be much less than this. Jenner states that after twenty-one days, local lesions sufficient to cause death were always discovered in typhus, that is to say, that after this date, death did not occur *from the fever alone*, as may be the case before the twenty-first day. He states the average duration to be from fourteen to twenty-one days; but not infrequently, in very mild cases, it terminates before the fourteenth day, in the same way as mild cases of scarlatina will cease before the average time arrives at which the fever is usually held to terminate.

4. *In the kind of eruption.* Nothing can be more distinct than the repeated scanty crops of rose-spots in typhoid fever, with their bright colour, their disappearance under pressure, and their duration of three or four days, compared with the permanent, dark red, or mulberry coloured, ineffaceable copious rash of typhus. Mistakes, sometimes arise, however, from the typhus eruption being seen on the second or third day of its appearance, at which time it disappears under pressure, as was noticed forty years ago by Wedemeyer, in his account of exanthematic typhus.

5. *In the colour of the skin, the expression of the face, and in manner.* Typhus patients often present in its highest degree those characters which the old writers often termed "oppression" and "prostration;" the face is darkly and generally flushed, the complexion muddy, (particularly after the sixth day,) the manner stupid and confused, and the eyes unintelligent. On the contrary, in typhoid fever, the complexion does not get muddy, except in a very slight degree; consequently the flush of the cheeks, when present, is bright and pinkish, and not dark red, and it is often circumscribed to the cheeks, and then is strongly contrasted with the surrounding pale skin. The manner, also, is often natural, or even a little sharp, provided there be no delirium. These differences are marked, even in the slightest cases, although in extremely slight cases of typhus the muddiness and flushing may be insignificant compared with the severe cases. In relapsing fever, the complexion is clear, or has a slight yellow or "bronzed look." (Cormack.) It is very conceivable that the peculiar complexion of typhus has not always obtained the attention it merits, on account of the confusion of cases of typhoid and relapsing fever, in which this complexion is not seen.

6. *In the severity and course of the head symptoms.* *Headache* is an almost constant symptom in each. Although there is considerable variation in individual cases, yet on throwing large numbers together, it becomes apparent that both in typhus and typhoid fevers, the *headache* has a determinate duration. In typhus it ceases usually on the tenth day, and always before the fourteenth day; in typhoid fever, about four or six days later, and may last till nearly the end of the third week. *Delirium* commences earlier in typhus than in typhoid, by several days. In Jenner's fatal cases, it was more *active* in typhoid; the patients were more vivacious, and disposed to leave their beds. *Somnolence*, although frequently absent in both, is more common and earlier in typhus than in typhoid. The peculiar symptom which has been appropriately called "*coma-vigil*," and in which, as Jenner defines it, "the patient lies with

his eyes open, evidently awake, but indifferent or insensible to all going on around him," occurred in one-fifth of his fatal cases of typhus, but in none of the typhoid patients.

7. *In the degree of loss of muscular power.* Typhus patients almost always take earlier to their beds, and are more completely prostrated at an earlier date than typhoid cases. This is well illustrated by Jenner's cases, as here typhus and typhoid cases were lying side by side in the same wards.

8. *In the frequency of epistaxis,* which is very rare indeed in typhus, rather common in typhoid, (one-third of Jenner's available fatal cases; nearly half of Louis'.)

9. *In the condition of the eyes.* In typhus fever the conjunctivæ are generally injected. and the pupils contracted; in typhoid fever, the conjunctivæ are pale, and the pupils larger than natural.

10. *In the state of the tongue,* which is drier, browner, and larger in typhus; is more frequently small, fissured, red, or partially covered with a pale-brown fur in typhoid.

11. *In the chest symptoms.* Sonorous rhonchi are very frequent in typhoid; rare, comparatively, in typhus. Dulness of the depending portions of the lungs, (a little above the bases,) depending on hypostatic congestion, is common in typhus, rare in typhoid.

12. *In the state of the pulse,* which is much more variable in typhoid than in typhus fever.

13. *In the abdominal symptoms.* The abdomen is *painful* on pressure, in about three fourths of typhoid patients; is almost always quite painless in typhus, or if painful, this is slight and transient. *Gurgling* exists in perhaps a fourth of the typhoid cases; in one fortieth of the typhus. The abdomen is *distended* and *resonant,* more or less in almost all cases of typhoid; it is, with scarcely an exception, natural in shape, or even a little concave, in typhus. *Diarrhœa* exists as a rule in typhoid, as an exception in typhus. *Intestinal hemorrhage* occurs in one third of fatal cases of typhoid; in no case of typhus without dysentery. The *discharges from the bowels* are different in the two diseases; in typhoid they are loose, watery, fawn or dark brown colour, alkaline from fixed alkalies, and contain a large proportion of soluble salts, and a small quantity of albumen. In typhus they are generally solid, often acid, or if alkaline, are so probably from ammonia, and in most cases do not appear altered from health, unless medicines have been taken. Although diarrhœa, meteorism, and abdominal tenderness are the rule in typhoid fever, it must not be supposed that they are always present. In some of the worst cases, the first abdominal symptom may be announced by peritonitis, consequent on perforation. But when vast numbers are collected, these exceptional cases are lost in the large proportion of those in which these symptoms exist in greater or less intensity.

14. *In the occurrence of epiphenomena and of sequences.* Sloughing from pressure is equally common in both diseases; but erysipelas, phlebitis, and local inflammations and ulcerations are much more common in typhoid fever. So also tubercular deposition in the lungs is decidedly more frequent as a sequence of this disease than of typhus.

15. *In the continuance of the eruption after death.* The spots of

typhus last uneffaceably after death; the rose spots of typhoid fever cannot be found.

16. *In the duration of cadaveric rigidity,* which ceases more quickly in typhus than typhoid cases, according to Jenner's interesting observations.

17. *In the more rapid dissolution* (so to speak) *of the tissues* in typhus than in typhoid. As an instance of this, it appears from Jenner's researches that the epithelium detaches itself very rapidly indeed from the basement membrane, a fact which is well seen when a microscopic section of the kidneys of typhoid and typhus patients are examined, or when the surface of the œsophagus is observed. To the same class of facts must be referred the abnormal facility with which, in typhus patients, the pia mater and arachnoid separate from the surface of the brain.

18. *In the frequency of the occurrence of hemorrhage into the arachnoid* in typhus, which occurred in one eighth of Jenner's fatal cases, while it was not found in one of his typhoid cases, nor in any of Louis' or Chomel's cases. The amount of intra-cervical serosity is also decidedly greater in typhus.

19. *In the frequency of ulcerated mucous membranes in typhoid fever, and the rarity of ulceration in typhus.* In typhoid fever, ulcerations in the pharynx exist in about one third of the cases ; but in typhus such lesion is never found, or is excessively rare. In typhoid, ulceration of the larynx and of the œseophagus occurs once in every 15th case; in typhus, ulceration of the larynx happens once in every 26th case; ulceration of the œsophagus very seldom indeed. In typhoid the gall-bladder and and the urinary bladder occasionally participate in this ulcerative tendency; in typhus they are never attacked, or very rarely indeed. So also the mucous membrane of the large intestine suffers frequently (in seven of 20 cases, Jenner,) in typhoid; but scarcely ever in typhus, unless there be concurrent dysentery, which is a composite disease, and distinguished without difficulty.

20. *In the occurrence of a peculiar exudation into and under the patches of Peyer, and into the mesenteric glands in typhoid fever.* This is constant in all cases which present the symptoms of typhoid fever; it is never absent, although its amount varies greatly in intensity. After the publication of Louis' work, Andral, Chomel, and others, observed cases which they thought were typhoid fever, without the anatomical sign; but these cases did not bear examination, and subsequent experience has proved that this lesion is constant. It never occurs in typhus fever.

21. *In the greater softness and flabbiness of the muscular tissue of the heart,* in typhus than in typhoid.

22. *In the frequency of lobular and lobar pneumonia in typhoid fever, and the rarity of these local inflammations in typhus.* In typhus, consolidation, or perhaps we should rather say, carnification of the depending portions of the lungs from congestion, is more common, but true inflammation is rare.

23. *In the more frequent occurrence of pleurisy in typhoid fever,* (40 per cent. of fatal cases, Jenner,) than in typhus (5.5 per cent. of fatal cases.)

24. *In the degree of softness of the spleen,* which is greater in typhoid than in typhus.

25. *In mortality;* that of typhoid being decidedly greater than typhus.

In addition to those differences, there is some evidence of different constitutions of the blood; but as the data are not very exact, we pass them over.

It is also possible that other differences may hereafter be indicated; thus comparative observations have not been made on the urine with sufficient care; the relative temperature of the two fevers, and other points of the like kind, have yet to be considered.

Such is the statement of differences which we have been able to glean from the writings on the subject. Although some of the distinctions may appear slight and trivial, yet others are not so. Thus among symptoms, the absolute diversity of the eruptions, and the state of the skin, the differences in the duration of the disease, in the mode of onset, and in the pronounced abdominal symptoms of one, with the absence of these in the other, are very marked. So also among post-mortem lesions, the entero-mesenteric disease, the tendency to ulcerations of mucous membranes, and to local inflammations, of typhoid fever, are strongly contrasted with the absence of pronounced local changes in typhus, and with the epithelial separation, apparently from prior injury to structure, which is so marked in that disease. So great are these differences, that we do not hesitate to affirm, if any one will take two confessedly distinct, yet somewhat kindred diseases, such as measles and scarlet fever, and will compare them in the way we have compared these continued fevers, he will not find a stronger case made out for their separation, than for that of typhus and typhoid fevers.

Jenner concludes his comparison in the following way:—

"At the commencement of this analysis, I proposed to examine whether typhoid fever and typhus fever differed from each other in the same way as smallpox and scarlet fever differed from each other; and for the purpose of comparison, I laid down certain grounds, as those on which we founded our belief in the non-identity of the two last-named diseases. Those grounds were:—

"1st. In the vast majority of cases the general symptoms differ; i. e. of smallpox and scarlet fever.

"This holds equally true with respect to the general symptoms of typhoid and typhus fevers.

"2d. The eruptions, the diagnostic characters, *if present,* are never identical, i. e. in smallpox and scarlet fever.

"The particulars detailed in the foregoing papers prove that this is as true of the eruptions of typhus and typhoid fever, as those of smallpox and scarlet fever.

"3d. The anatomical character of smallpox is never seen in scarlet fever.

"Just in the same way, the anatomical character of typhoid fever, i. e. lesion of Peyer's patches and the mesenteric glands, is never seen in typhus fever.

"4th. Both, i. e. smallpox and scarlet fever, being contagious diseases, the one by no combination of individual peculiarities, atmospheric variations, epidemic constitutions, can give rise to the other."

III. *Are these differences always well founded, or is it not possible*

that, existing in well-marked cases, they may yet not be constant, but may disappear in some transition cases.

The assertors of the non-identity state that they have never been able to find any transition forms. Jenner, in London, during the last four years, has seen 2000 cases, all of which could be referred to one or the other form of fever without difficulty. Gerhard and Bartlett, and the other writers on the same side, assert the same thing.

Similar evidence is to be found in that vast mass of instructive matter, which the zeal of the editor of the 'Dublin Medical Journal' has collected. In the history of the terrible Irish fevers of 1846-47 and -48, contained in that excellent periodical, we find the most undoubted evidence, that exanthematic typhus and relapsing fever were the two great scourges, and that typhoid fever, dysentery, and scurvy were here and there intermixed. Frequently, when the writers have been little aware of it, they have given the strongest proofs of the existence of several intercurrent forms of fever.

It should be also remembered that the positive evidence in favour of the non-identity has been gradually accumulating for several years. *Every one who has paid attention to the subject* has adopted the same conclusion. And that the difference between the two diseases are not dependent on any variety of epidemic constitution present in one year, and not in another, is proved by the length of time over which the observations run; Stewart's, Shattuck's, and Jenner's paper make up an aggregate period of observation of nearly fifteen years, during which time every one who has attended to the point has recognised these distinctions. In America, also, Gerhard's observations were made sixteen years ago; and every year since that time has more firmly convinced him and other American observers of their accuracy.

When to this strong argument, that the positive evidence is (with one probably unimportant exception) all on one side,—and when, in addition to the fact that Pringle and Huxham, who were so familiar with fevers, distinguished two forms, which it is almost certain were the typhus and typhoid of our own days, and that Armstrong also, more lately, has observed and described two fevers, and that since Louis fixed the symptoms and the post-mortem lesions of typhoid fever, the evidence in favour of the correctness of his views, and consequently of the specific difference between it and other fevers, has been constantly augmenting, —when to all these arguments we are able to add, that if we admit these several forms of fever, the discrepancies between the observations of different countries disappear, order is introduced into this intricate and perplexed subject, and light thrown suddenly on its dark and obscure outlines,—we are certainly strongly impelled to admit at once the truth of Jenner's conclusions, and to separate typhus, typhoid, and relapsing fever, as completely as we do smallpox and scarlet fever.

To the reasons we have above adduced for adopting the doctrine of a diversity of fevers, we are able to add one more, viz., the fact that fever of one form always gives rise, as far as observation at present goes, to a similar disease, and to no other. It was noticed by Henderson, in Edinburgh, that typhus did not arise from intercourse with persons affected with relapsing fever. His conclusion is, "that in not a single

instance has the typhus fever presented itself in circumstances that warrant the opinion that it must have been produced by the contagion of the epidemic fever." (Op. cit., p. 218.) The same question has been elaborately argued by Jenner. Typhoid fever produces a like disease, but not typhus or relapsing fever; and each of these two latter diseases produces its own kind, but no other.

We may, therefore, state our answer to the proposed question in the following terms:—The facts adduced in evidence of the specific differences of typhus and typhoid fever are sufficient, if they be hereafter proved to be universal; there is no evidence for the identity of the three diseases, which can be at all compared, in point of precision and extent, to that which goes to prove their non-identity; and it is, therefore, excessively probable, strange as it may seem, that the progress of inquiry will soon enable us to decide positively that in the *fever* of Great Britain, diseases the most diverse have been bound together by the enthralling yoke of a simple name.—*Brit. and For. Med. Chirurg. Review, July* 1851, *p.* 1.

2.—ON THE EFFICACY OF LARGE AND FREQUENT DOSES OF QUININE IN ARRESTING THE COURSE OF CONTINUED FEVER.

By Dr. Robert Dundas, Physician to the Liverpool Northern Hospital.

[Early in the present year Dr. Dundas explained his views on the pathology and treatment of tropical fevers, and in which he stated his belief that the continued fever of this country was the same as that of the Tropical countries, and curable by the same means. Acting then on this conviction of the identity of the remittent and intermittent fevers of the tropics with the typhus fever of this country, and being aware of the specific action of quinine in every stage of the former diseases, Dr. Dundas has resorted to the administration of quinine in all stages of the typhus of this country, with the happiest results. He says,]

In typhus, as in the remittent and intermittent of hot climates, the treatment by quinine will be successful in proportion to its early administration; also, as in the tropical fever, the doses should be large—ten or twelve grains,—and repeated at intervals not exceeding two hours. Three or four doses will, in most cases, be sufficient to exert the specific influence of the medicine, which is displayed by dizziness of the head and tinnitus aurium, or in the rapid subsidence of all the urgent symptoms. In the latter event, three grains of quinine, or some vegetable bitter infusion, should be administered three times a-day, and the patient supported with some good beef-tea or other light nutriment, and wine, if necessary. Should the urgent symptoms return, the large and repeated doses of quinine must be again resorted to. Slops should be avoided, and purgatives also, unless obviously indicated; but an emetic of tartarised antimony, when the *prima via* is loaded, will often prove useful at the commencement, and seems to render the system more obe-

dient to the specific influence of the remedy. Should the urgent symptoms persist, notwithstanding the administration of four or five doses of quinine ; or should dizziness of the head and tinnitus aurium supervene, the medicine must be discontinued ; and after an interval of six or seven hours, small and repeated doses of tartarised antimony should be resorted to, until full vomiting is induced. The patient should then be allowed to rest for twenty-four hours, when the quinine should be recommenced as before. If the symptoms still resist, the remedies may be repeated in succession, as above stated, for a period of four or five days ; and, unless the beneficial effects are broadly marked within that time, we can no longer reasonably hope for success from this treatment, and it must be abandoned. Still, in the great majority of cases of uncomplicated typhus, taken at the commencement, complete and rapid success may be calculated on ; and, in all, the diseased chain of actions will almost invariably be broken—no unimportant advantage in the treatment of any malady. In the advanced periods of the disease, the results will be much less certain; but, in all stages, the large doses of quinine may be safely resorted to, and will commonly calm the patient, cool his skin, allay the headache, and reduce the frequency, and improve the character of the pulse. It must, however, be borne in mind, (as I have elsewhere pointed out,) that any vital organ being seriously involved will prove a disturbing cause to the curative powers of the remedy, which are clearly exerted on the nervous system, through which the blood and secretions are favourably modified, and often with marvellous rapidity.

In the history of typhus in this country, numerous incidental notices will be found, such as the following on the epidemic of 1819:—"The disease has simulated the recurrent type; the paroxyms were marked by distinct, and often violent rigors, which were succeeded by intense heat, and increased vascular activity, terminating occasionally in profuse sweating, but more commonly in gradual subsidence of the exacerbation, without any relaxation of the surface. The paroxysms showed no obedience to periodicity; in some cases recurring in a few hours, and, in others, only after the lapse of as many days." Now, here we are presented, clearly and distinctly, with the history of an irregular intermittent or remittent fever; yet, strange to say, this idea seems never once to have crossed the mind of the observer.

As I well know, by experience, how distasteful an array of cases commonly proves, I shall only relate two or three; but these are well adapted to illustrate, beyond all rational doubt, the justness of the principles and the efficacy of the treatment which I have just inculcated. The cases are divested of all minute detail, as I am anxious to place the broad facts clearly before the Profession, so that they may be easily impressed on the memory, and in order that they may be submitted to large and careful experiment. The two cases now to be related were received into the Liverpool Northern Hospital, one under myself, the other under my colleague, Dr. Scott. The notes were taken by our intelligent house-surgeon, Mr. Evans, and are given in his words:—

"*Case* 1.—Cornelius Vincent, aged 26, was admitted October 2, 1850, into Ward No. 12, under Dr. Dundas.

"October 3.—He had been ill ten days. Present state: severe headache; anxious countenance; slight delirium; skin hot and dry; tongue black, dry, and furred; teeth covered with sordes; thirst; urine scanty and high-coloured; bowels open; pain of abdomen on pressure; pulse 100; respirations 28.

"℞. Disulphas quinæ, gr. xxx. Divide in doses iij., quarum capiat unam secunda quaque horâ.

"October 4.—*Convalescent.* The pain in the head and the delirium have ceased; the abdomen is less tender; the heat of the skin diminished; the tongue clean and moist; pulse 90; respirations 24.

"℞. Infusi quassiæ, ℥iii., ter in die.

"No further treatment was resorted to, and from this date he rapidly gained strength, and was discharged well on the 11th October.

"It is the ordinary rule not to admit cases of typhus into the Northern Hospital, but to send them to the Fever Hospital. The above case, however, having been reported to my colleague, Dr. Scott, he resolved to give the treatment by quinine another trial. An opportunity presented itself in a few days.

"*Case* 2.—Edward Donald, aged 23, was admitted on 25th October, 1850, into Ward 14, under Dr. Scott. He had been ill eight days. Present state: great anxiety of countenance, and high delirium; dry pungent skin; tongue dry, and coated with dark fur; sordes about the lips and teeth; great thirst; urine scanty and high coloured; bowels open; abdomen tumid, and tender on pressure; pulse 108; respirations 30.

℞. Disulphas quinæ, gr. xxx. Divide in doses iij., quarum capiat i. secunda quaque horâ.

"October 26.—*At the morning visit, he was found reading a book in bed!* All the formidable symptoms of yesterday have disappeared. No further medical treatment was resorted to in this case, and he was discharged well on the 5th November.

The same treatment has been adopted in several other cases of fever admitted into the Northern Hospital, and with equally good success. In one case, that of Ann Dobbin, one of the hospital nurses, the effect was highly instructive. Attacked with well marked typhus, she was treated for three or four days on the ordinary routine system, by purgatives, salines, and diaphoretics. Under this treatment, she daily became worse; the cerebral disturbance, lumbar pains, heat of skin, and thirst gradually became more intense, the pulse more frequent, the tongue dry and brown, and sordes began to appear about the teeth and lips. Ten grains of quinine were now given every two hours, with the result, after the sixth dose, of arresting all the unfavourable symptoms. The pulse calmed down; the tongue became moist and clean; the sordes disappeared; the heat of skin, thirst, cerebral and lumbar pains, all moderated, and she rapidly improved without any further medical treatment beyond the administration of a little wine.

[Knowing that Mr. Eddowes, of the Liverpool Fever Hospital, had treated typhus cases with quinine, Dr. Dundas enquired of him the results. The following is from Mr. Eddowes' reply.]

"I have used it, during seven weeks, in every case of typhus, giving five grains every three hours; and the success has been most marked.

"The day but one after its administration generally finds the patient better; the petechiæ gradually fade, and the fever leaves its unhappy victim.

"In diet, I give milk, arrow-root, and beef-tea; also wine, if necessary.

"The superiority of your plan of treatment consists, I believe, in the simple fact, that it either *cuts the fever short, or prevents the accession or increase of the more formidable symptoms;* while, in the ordinary treatment, (the *médicine expectante,*) the physician only interferes when death is on the point of claiming the sufferer for his own.

"The cases in which I have used the quinine have been eruptive typhus,—not a single case of typhoid fever.

"The quinine frequently excites vomiting of a grass-green liquid; but I do not discontinue it on that account."

I have subsequently had two interviews with Mr. Eddowes at the Fever Hospital, when he kindly permitted me to verify the results of the practice by a personal examination of his patients; at the same time declaring, in emphatic terms, his sense of the importance of my system, and of its vast superiority over all others heretofore resorted to in the treatment of typhus fever.

It will be remarked, that the improvement in the patients at the Fever Hospital was generally apparent only on the third day from the commencement of the remedy; whilst, in my own patients, the improvement is generally established within the first twenty-four hours. Mr. Eddowes, however, it will be observed, did not push the remedy to its full extent. He administered only five grains every three hours, instead of ten grains every two hours, as I have recommended; and this, I believe, will satisfactorily account for the slight difference in the results. He at the same time informed me—and allowed me to state the fact—that, from the high price of quinine, and the large number of patients in hospital, he was induced, by motives of economy alone, to try first the effect of the smaller doses. As regards the question of economy, very properly adverted to by Mr. Eddowes as a public officer, I am satisfied that if the plan of treatment in typhus, now laid before the Profession, be adopted by public institutions, its superiority to all systems hitherto practised will be at once manifested; and not alone in the economy to human life and suffering, but—what is scarcely less esteemed in this economical age—by the vast pecuniary gain to the public from the rapidity and certainty with which typhus may be arrested —CURED, *malgré* Pitcairn—and the patient thus restored to his ordinary occupation, ceasing to be a burden on the funds of the community.

Yet, we are told, on high authority, that "in the continued fevers of this country, we believe it (bark) might with great safety be erased from the list of remedies altogether." Another author of acknowledged eminence, Dr. Pereira, in his standard work on Materia Medica, lays down that, "in febrile conditions of the system, attended with a hot and dry skin, and a furred and dry tongue, tonics act as local irritants and stimulants, and add to the severity of all the morbid symptoms,"—

p. 208; and he illustrates his doctrine by the action of disulphate of quina in fever! Again, Dr. Watson, deservedly one of the highest (as well as the most recent) authorities in medicine, adopts, in its fullest extent, the well known maxim of Pitcairn,—"You may *guide* a fever; you cannot *cure* it."

When these high-vouched theories are measured by the facts which I have just stated, all of which have also been observed by others, I feel convinced that, however distinguished the names which have sanctioned these doctrines, they will be proved to be utterly unfounded. So fatal, indeed, are they, that, when we take into account the extent and mortality of fever in all its forms, in every clime, and in every class, I question whether their application to the actual treatment of human disease will not outweigh, in danger to health and life, all the advantages to be derived from the more enlightened views of modern medicine.

The cases which I have related, even if they stood alone, which they do not, would afford cogent evidence, not only in support of the treatment adopted, but of the truth of the doctrine on which such treatment is founded,—viz., the essential identity of the typhus of this country with the intermittent and remittent of the tropics, modified by climate and numerous other influences. In fact, I believe that the history of fever must, and will ere long, be rewritten.

The power of quinine in controlling the remittent and intermittent fever, (and the yellow fever also, as stated by Dr. Blair,) is now a well-established and important fact; although I totally dissent from the received doctrine of its specific action on the *several specific poisons* which originate these fevers. Moreover, I have demonstrated, that, in sufficient doses, it displays an equal power in subduing the supposed animal poison of the typhus fever.

The action of quinine is clearly not that of a tonic, in the ordinary sense of the word; its action is obviously on the nervous power, whose functions it favourably and rapidly modifies, when depressed or exhausted by any of the numerous moral or physical agencies which act in causing fever, and thus it restores to the organic nervous system its normal influence over the animal fluids and vital phenomena. Hence the curative powers of quinine in fever, and in many other apparently dissimilar maladies.—*Med. Times, Oct.* 4, 1851, p. 346.

3.—ON THE NATURE AND TREATMENT OF HAY-FEVER.

By Dr. F. W. Mackenzie, Physician to the Paddington Free Dispensary, for the Diseases of Women and Children, &c.

[Although we do not know in what the peculiar susceptibility consists, it is nevertheless certain that the respiratory mucous membrane is in some persons peculiarly susceptible to certain impressions, and readily disposed to take on morbid action in consequence. But although the symptoms and exciting causes may differ in many cases, yet they depend upon the same proximate cause, and are amenable to the same general principles of treatment. With regard to the pathology and treatment

of hay asthma, it may be remarked that little is known; and in many cases all treatment has proved of no avail. From the state of the mucous membrane, in the case of a gentleman who consulted Dr. Mackenzie, he was led to employ arsenic, from the analogy which appeared to him to subsist between its pathological condition, and that of the skin in some forms of prurigo. The result is described as follows:]

Mr. A. S. had for many years suffered during the summer months from hay-asthma, or rather catarrh; but his present attack had been of unsual severity, partly from the extreme dryness of the season, and partly from his having been obliged to live a great deal in the country during the summer, and consequently much exposed to the emanations from hay and grass. He had been suffering from this attack for many weeks before I saw him, and its severity had told painfully upon him. The whole of the respiratory surface, from the frontal sinuses to the bronchi, was excessively irritable, and in some parts inflamed; the eyes were blood-shot and suffused; the nose painful and tumid, and the nostrils inflamed and almost excoriated; his throat was dry and rough, and throughout there was a copious defluxion, with lachrymation and coryza. In addition to the local, the constitutional symptoms were severe. The pulse was quick, the skin hot, the tongue furred, the appetite bad, and the secretions from the liver and intestines scanty and unhealthy. The patient was restless at night, and had very little uninterrupted sleep. The continuance of these symptoms had very materially changed his appearance; he had become emaciated, pale, and haggard, and altogether was in a very pitiable condition.

Having learnt that he had consulted many persons, and taken various remedies without benefit, and having no particular treatment to suggest, I had intended leaving without prescribing, but it struck me, during my visit, that there was a close resemblance between the state of the respiratory mucous membrane in his case, and that of the skin in some forms of prurigo; and having often seen the beneficial effects of arsenic in the latter affection, I was led to think that it might be serviceable in the present case. Thus, in both cases there appeared to be a peculiar or specific irritation of their respective surfaces. Both appeared to depend primarily upon nervous rather than upon vascular disturbance, and each to consist essentially in an exaltation or perversion of nervous action,—the one of the organic, the other of the sensory nerves. Impressed with this view, I recommended a trial of this medicine. It was commenced on the 11th of July, in five minim doses of Fowler's solution three times a day; and by the 16th nearly every vestige of the complaint had disappeared. The patient, however, was so sceptical in regard to medicine, that he was unwilling to believe that his improvement was attributable to it. He rather thought that the complaint had worn itself out, and this view was favoured by the lateness of the season: my own impression was otherwise; but I was willing to let the matter rest, to be decided by further investigation.

During that year, I saw no other case of the disease; and it was not until the following summer that I was enabled to make any further observations in regard to it. I had then the opportunity of trying the medicine in several cases, and in all with encouraging success. A pro-

fessional friend, whose experience and judgment are very great, has also given it, at my suggestion, with much benefit: and it has been given successfully by a practitioner of extensive practice in the country. These facts, so far, are favourable to its employment in these cases? and it is with the view of drawing attention to it, and of eliciting the results of more extended observation, that I am led to publish the present communication.

Of the precise pathological nature, or the proximate cause of hay fever, we are, as has been stated, altogether unacquainted; and we are therefore unable to deduce from a consideration of it any satisfactory method of treatment, and so far must be content to adopt either empirical measure, or such as analogy may suggest. I have remarked that the more obvious symptoms of the disease appear to depend upon, or to be connected with, a morbid irritability of the organic nerves of the respiratory mucous membrane; and that in this respect it presents some analogy to a kindred affection of the skin, characterised by extreme irritability of the cutaneous nerves, and one at the same time in which arsenic is extremely efficacious. Upon this ground, I was more particularly first led to employ it; but there are other considerations which recommend it to our notice. In the first place, the *origin* of this complaint is very similar to some in which it has been given with much benefit, such as remittent and intermittent fever, neuralgic affections, and some forms of rheumatism, which, in common with hay-fever, are traceable to malaria, miasmata, or vegetable effluvia of various kinds; whilst in the more specific actions peculiar to these, and in the morbid condition of the nervous system which prevails, we see much that is analogous in all. But independently of these more specific diseases, we have many and undoubted proofs of the utility of arsenic, in correcting or controlling irregular nervous actions, and morbid conditions dependent upon them; and its remedial powers in chorea and epilepsy, in prurigo, lepra, psoriasis, and many other cutaneous diseases, may be cited in illustration. Within certain limits, most writers agree in considering it as a tonic; and as such, its action is especially marked upon the skin and the mucous membranes. An eminent practitioner remarked that, for strengthening and giving tone to the former, he knew of nothing equal to it; and in regard to the latter, it has evidently a specific action upon that of the whole respiratory tract. Hence its administration, when given too largely, or for too long a period, is occasionally followed by redness and irritation of the eyes and eye-lids, coryza, dryness of the throat, cough, and symptoms of pulmonary irritation; and, on the other hand, it moderate doses, it has been given beneficially in various irritable and morbid conditions of this membrane, such as is met with in asthma, hooping cough, catarrh, ophthalmia, &c.

Mr. William Simmonds, of Manchester, gives the following report of its employment in hooping cough, in a letter to Dr. Duncan, published in the second volume of the 'Annals of Medicine' for 1797, p. 393. "For upwards of three years, I have given arsenic in the hooping cough with the most salutary effect. In general, it has put a stop to the disease in about a fortnight; and it has never failed to moderate it in a few days. I have administered it in one unsuccessful case only, and even then it

afforded considerable relief; and had I been called in earlier, or had I been permitted to pay the attention the case required, I am of opinion it would have succeeded in that also. I have used it in the form of the mineral solution of Dr. Fowler; and in the dose, and with the precautions recommended by him in his work on Intermittents, &c., children of a year old may take it with safety. Previous to, and during its use, bleeding, blisters, and emetics may be employed, according to the indications, particularly the latter. It should be continued until the disease is subdued; and then leaving it off for a week, it should then be had recourse to for a week, to prevent a return. Should exposure to cold occasion a relapse, it has hitherto put a stop to it, upon being taken for a few days.

In some forms of ordinary catarrh, I have myself given arsenic with the best results; but more especially in those cases in which the affection has been of a local character, and there has been an absence of inflammatory action, as well as of febrile disturbance. These circumstances forbid its employment; and it is because they so frequently occur in connexion with catarrhal complaints, that it is for the most part inappropriate. Where, however, there is irritation of the mucous membrane rather than inflammation, as is especially the case in hay fever, it may be employed with much advantage, as is shown in the following instances.

Case. Rebecca Lord, aged 45, applied at the Paddington Free Dispensary, October 8th, 1850, suffering from catarrhal symptoms—sneezing, coryza, lachrymation, cough, and slight fever; tongue furred and unpleasant; bowels open.

℞. Lig. pot. arsentis ʒj; vini ant. tart., vini ipecac., liq. potas. āā ʒiiss; aquæ distil. ad ℥xij., M. Fiat mistura cujus sumatur ℥j ter die.

On the 11th, she was perfectly well; all the catarrhal symptoms had left her. She took eight doses of the mixture; but in twenty-four hours she was relieved of all uneasiness of the mucous membrane.

Case. Mary Ann West, aged 15, applied at the Paddington Free Dispensary, July 26th, 1850, suffering from catarrhal symptoms—coryza, lachrymation, defluxion, cough, sore throat, and slight febrile disturbance.

℞. Liq. pot. arsenitis ♏iiij; liq. potassæ ♏x; aquæ distil. ℥iss. M. Ft. haust. ter die sumendus.

July 30. She was free from all catarrhal symptoms, and felt perfectly well.

Case. Margaret Liddon, aged 55, applied at the Paddington Free Dispensary, August 13, 1850, suffering from catarrhal symptoms, together with constrictive pain of the chest, dyspnœa, and cough. She had been troubled with these latter symptoms for some time; throat dry; tongue unpleasant and furred in the morning; bowels constipated; appetite bad.

℞. Liq. pot. arsenitis ♏xxv; liq. potassæ ʒj; tincturæ hyoscy. ʒij; aquæ distil. ad ℥viij. M. Fiat mistura cujus sumatur pars sexta ter quotidie. Sumat pil. hydrarg. gr. v.

August 23rd. She was entirely relieved of cough and all pulmonary irritation.

In catarrhal ophthalmia, and more especially in those forms which are of a passive, subacute, or chronic character, or where the irritability

of the conjunctiva is excessive, arsenic has a very beneficial effect. I might subjoin cases in illustration of this fact, were it not well known to oculists, and referred to in systematic treatises on diseases of the eye.

Lastly, in intermittent headaches, brow ague, cephalalgia, and other affections in which the mucous membrane of the frontal sinuses appears to be the seat of pain, arsenic has proved efficacious. These facts are all of importance, in connexion with the subject of the present communication.

The cases of hay-fever in which I have seen it most serviceable have been of a catarrhal rather than of an asthmatic character; and I have given it, on an average, in doses of five minims of Fowler's solution three times a-day. Where, however, the attack has been slight, or the medicine has been given with the view of improving the tone of the mucous membrane rather than of correcting morbid action, three-minim doses, or even less, are preferable; whilst, on the other hand, if the irritation has been excessive or resists these, larger doses may be given, and their action modified or assisted in different cases by remedies of a kindred character.

Dr. Fowler, to whom we are indebted mainly for our knowledge of the efficacy of the medicine, was in the habit of prescribing it much more largely than is done at the present day. To adults, he gave his solution in doses averaging from ten to sixteen minims twice or thrice a-day. He mentions that fifty minims were taken by mistake, within the space of nine hours, by a patient, without any very serious consequences ensuing; and that, in one case, twenty drops were taken three times a-day, with speedy and permanent advantage.

Dr. Brown ('Cyclopædia of Practical Medicine,' vol. ii, p. 288,) who gave it in many hundreds of cases, states that he never saw any permanently ill effect arise from it. These facts are adduced, as showing the harmlessness of the medicine when properly given, and as meeting an objection which might otherwise be urged against its use.

Arsenic is best given, in this affection, in moderate doses, and I should propose smaller than those recommended by Dr. Fowler, whose experience led him to lay down the following rules for its administration: "Patients from two to four years," he says, "may take from two to four drops of the solution; from five to seven years, may take from five to seven drops; from eight to twelve years, may take from seven to ten drops; from thirteen to eighteen, may take from ten to twelve drops; and from eighteen and upwards, may take twelve drops as a dose." He advises that doses proportional to the age of the patient should be administered three times a-day for five days; then omitted for two or three days; and then repeated for three days, to prevent a relapse. These doses are mentioned with especial reference to the cure of intermittent fevers. They are much too large for the cases under consideration; for which, from one to five minims of the mineral solution may be considered as an average dose, and beyond this it will seldom be necessary to carry it, while positive harm may result. Seeing, indeed, that the state of the mucous membrane is one of morbid susceptibility to impressions, and that the medicine has a specific action upon it, it is important to keep within due limits and so avoid any severe or unfavourable reaction.

When the medicine alone fails to do good, its use may be alternated with quinine, or the two medicines may be given concurrently. Dr. Fowler found this practice successful, in the treatment of intermittent fevers, when either bark or arsenic, singly administered, failed to remove the disease. He observes: "if the solution and Peruvian bark have been given separately, and have failed, it will sometimes be advisable to try the joint power of the medicines at the same time, but in doses rather smaller than usual. In these cases, the solution should be given at stated hours three times a-day, and the Peruvian bark may either be given combined with it, at the same periods or between the fits, in as frequent doses as the stomach can bear." Another useful addition to arsenic, when the irritation of the mucous membrane is severe, or the stomach is unpleasantly affected by it, is opium, in small doses: indeed, its general employment in conjunction with arsenic has been recommended by many practitioners, as being calculated to render its action not only more certain, but less disagreeable to the stomach; and in cases like the present, where the irritability of the part more immediately affected is excessive, its use is otherwise appropriate. It is best given in small doses, not exceeding two or three minims of the tincture or of Battley's solution; and should it derange the stomach, or interfere with the secretory functions of the liver or other organs, some other sedative may be substituted. I have seen very favourable effects from the Indian hemp in cases of morbid irritability of the nervous system, and these would lead me to recommend a trial of it in the present disease. The most efficacious preparation is the ætherial tincture.

Lastly, when the irritation is most marked in the pulmonary portion of the mucous membrane, and the symptoms are of an asthmatic rather than catarrhal character, ipecacuanha, antimony, squill, or some other expectorant, may be given concurrently with it, if circumstances indicate the employment of such remedies.

But in addition to the more specific treatment of the disease, much may be done in the way of prevention, by invigorating the nervous system, and improving the tone of the respiratory mucous membrane; and measures that fulfil these objects should be perseveringly employed by persons who are subject to these attacks. In particular, the daily use of the shower bath, the application of cold locally to the chest, neck, and shoulders, and the use of cold collyria and gargles, may accomplish much good. The diet and regimen also should be subservient to these ends; and if there exist an undue irritability of the nervous system, depending on a defective condition of the blood, steel in some appropriate form should be given.

I would further observe, that when the disease is fully developed, and the irritability of the mucous membrane is very great and distressing to the patient, it may be very much mitigated by the occasional application of the vapour of warm water. By holding the face over a large basin of boiling water, and retaining the steam by means of flannel thrown over the head and shoulders, it is readily and directly brought in contact with the whole respiratory branch, and affords very striking relief to the irritation which exists. Of medicated

vapours I have no experience; nor have I seen any benefit derived from the topical application of lotions of the nitrate of silver, &c. Indeed, seeing that the disease is seated rather in the nervous system than the mucous membrane, I should anticipate less benefit generally from local than from constitutional treatment.

These, then, are the principal points to which I would direct attention, in the treatment of hay-fever:—1. to preventive measures, comprehending, more particularly, tonic treatment in every available form, both local and constitutional; 2. to specific treatment, comprising more especially the administration of arsenic, and modified or assisted in the manner proposed, according to the requirements of individual cases; 3. and lastly, to soothing or palliative treatment, which is not inconsistent with the former, but may be advantageously combined with it.—*London Journal of Med., July,* 1851, *p.* 637.

4.—*On the Use of Colchicum in the Delirium and Coma of Scarlatina* —By Professor Bennett, Edinburgh.—A boy, aged 14, entered the clinical ward on the third day after experiencing distinct rigors. There was restless delirium, and constant moving of the head from side to side upon the pillow. He was apparently conscious when spoken to, but could not answer questions—the tongue was protruded with difficulty, dry, and of bright red colour, studded with florid elevations—deglutition was much impeded—bowels open—pulse 130, weak—urine voided with difficulty, and diminished in quantity—sp. gr. 1025—not acted on by heat and nitric acid—skin hot and dry, covered with the bright red scarlatinal eruption.—*Ordered salines and slight diuretics.* He continued in the same condition, the angina coma and alternating delirium, however, being more pronounced until the sixth day. During this period all the urine passed was carefully examined. The amount was diminished (17 oz. per day), but it was free from deposit, and unaffected by heat or nitric acid.

℞. Sp. æther. nit. ʒ iij; pot. acet. ʒ ij; tr. colchici ℥ ss.; aquæ ℥ iij. Ft. mist. A teaspoonful to be taken every four hours.

On the following day all coma and delirium had disappeared. He answers questions when put to him—skin cool—eruption faded—pulse 96, weak—passed 30 oz. of urine, which is turbid, with small flakes of a membranous character floating in it. On the 8th day the quantity of urine excreted was 50 oz., and it was still more loaded with sediments. On examining the urine with a microscope, it was seen to contain—1st, membranous flakes, composed of aggregated rounded particles, apparently agglutinated together, and strongly resembling some forms of vegetable tissue—2d, rounded and irregular masses with spicula—3d, amorphous molecular masses. The whole of these elements on being analysed by Mr. Drummond, were found to consist of urate of ammonia. Next day the urine was only slightly turbid, and on the following one, was perfectly clear. From this time the boy gradually recovered.

Commentary.—This was a very severe case of scarlatina. The angina was intense, occasionally rendering deglutition impossible. There was

delirium on the third day, alternating at night with coma, which was often profound. The worst result was apprehended: It recurred to me that the head symptoms in this as in several cases of typhus, might probably depend not so much upon inflammation of the brain, as is generally supposed, as upon absorption of, and poisoning by, urea, an idea that appeared to me supported by the diminished quantity of the renal excretion, as well as its freedom from all deposit. Remembering the alleged virtues of colchicum in increasing the elimination of this excretion, I ordered it, in combination with diuretics, and the result was remarkable. For on the next day, not only had the fever diminished, but the urine was increased in amount and loaded with urates to an extent and in a form I had never previously seen. It may be argued that the fever had terminated by a natural crisis on the seventh day; but I cannot help thinking that in this case nature was assisted by the colchicum and diuretics. At all events, this medicine seems to me worthy of more extensive trial in scarlatina accompanied by diminution of urine and head symptoms.—*Monthly Journal of Med. Science, August* 5, 1851, *p.* 158.

5.—*On the Internal Administration of Belladonna in Scarlet Fever.* By Benjamin Bell, Esq., Edinburgh.—[Some favourable cases occurring in George Watson's Hospital, Edinburgh, Mr. Bell determined to test the alleged prophylactic virtues of the belladonna, and to give it a full and fair trial. He says—]

On the 21st of February, upon the appearance of a second case of scarlet fever, the fifth part of a grain of the extract was given, morning and evening to each of the boys. The dose was found, in a few days to be too large, from the dilated state of the pupil and impaired vision which it occasioned in several instances. It was accordingly diminished, and then administered without interruption, to all the boys who continued well, until the 7th day of June,—a full month after the last case of scarlet fever had occurred. It is important to remark, that the second case already referred to had been in the sick-room, separated from the rest of the boys, for more than a week before the symptoms of scarlet fever appeared, and that no additional case occurred until the 21st of March, an entire month after the belladonna had been regularly administered. There was thus ample time for the manifestation of its virtue as a prophylactic; but the subsequent occurrence of so many cases seems to throw considerable dubiety over the existence of any such power. No experience of a merely negative character can be regarded as of much weight, when contrasted with this positive experience now detailed. It is by no means unusual to meet with only two or three cases of scarlet fever, in a large assemblage of children, without the belladonna having been used at all; and, therefore, we are not called upon to give it the credit of securing a similar exemption in cases where it it has been administered; but, surely, the occurrence of twenty-three cases out of fifty-four boys, who might be legitimately reckoned liable to the disease, is an overwhelming evidence on the opposite side.

Possibly, the administration of the drug may be useful in some cases, by inspiring confidence, and so indirectly fortifying the system against contagion; but we cannot divest ourselves of the impression, that the continued use of a narcotic for weeks together, even in small doses, must be prejudicial to health; and that thus, while failing to defend the individual against infection, it may render him less able to cope with the disease when it really comes. Certainly, a large proportion of the boys who took the belladonna, seemed to have more or less furring of the tongue, impairment of appetite, and other evidences of slight indisposition.—*Monthly Journal of Med. Science, August*, 1851, *p.* 107.

6.—*Scarlatina.*—Dr. Volz has recorded his experience of a severe epidemic of scarlatina in Carlsrhue, from which he draws the following deductions:—

1. The extent and redness of the eruption are not in direct ratio to the severity of the disease.
2. The proximate cause of the exanthem is a stasis in the cutaneous capillaries.
3. The exfoliating scales of epidermis do not transmit the contagious principle of the disease.
4. The mucous membranes undergo the scarlatinous eruption equally with the skin.
5. The lesions of the throat are of three varieties,—catarrhal, inflammotory, and gangrenous.
6. The inflammation of the parotid which accompanies scarlatina seldom terminates in suppuration; that which follows the subsidence of the exanthem, often suppurates.
7. In the consecutive anasarca the alterations in the kidney are secondary, and depend on the change in the composition of the blood.
8. Death may occur in scarlatina from the following causes:—congestive apoplexy, suffocation, pyæmia, and anæmia.—*Prov. Med. and Surg. Journal, June* 25, 1851, *p.* 359.

7.—ON LEUCOCYTHEMIA.

By Professor Bennett, Edinburgh.

[In the first article of our last volume (vol. 23) the reader will find a very interesting paper on the subject of white cell blood (Leucocythemia), which is a proper introduction to the present one. Professor Bennett has established the existence in the blood of an excess of the colourless corpuscles; a condition highly important to the pathologist and physiologist. He says—]

The blood may be loaded with a multitude of cells, exactly resembling those of pus; that such blood may circulate in the human subject for months, or even years, without destruction to life, and that this condition is always associated with disease in those organs, the functions

of which have hitherto been involved in the greatest obscurity, constitute facts which seem calculated to exercise an important influence on many views that have been long agitated in science. The constitution of the blood itself; the origin of its morphological elements and chemical proximate principles; the importance of the lymphatic system; the functions of the spleen and other blood glands; the nature of purulent infection, and other diseases of the blood, may be expected to be more or less elucidated by a study of the accompanying phenomena, causes, and results, of leucocythemia. With a view, then, of stating as succinctly as possible the conclusions which may be legitimately derived from the thirty-five cases previously recorded, I shall divide this part of the inquiry into several sections, in which all these important topics will be shortly considered.

I. *Symptoms observed in individuals affected with Leucocythemia.*—The symptoms have been very carefully observed in several of the cases recorded in the first part of this memoir, but we have great difficulty in referring any of them to the mere alteration in the blood. Several of those which were most constant and best marked in advanced cases, were apparently caused by the increased size of the spleen or liver, as they have been seen to occur in other cases where these organs have been enlarged, without the occurrence of leucocythemia. No doubt the peculiar change in the blood of which we are treating has been discovered in individuals affected with enlarged spleen; but this may arise from the circumstance, that the circulating fluid has been more frequently examined in persons labouring under that complication. When leucocythemia, however, is more generally studied, it will very probably be found associated with enlargement in other organs, especially of the thyroid, thymus, supra-renal capsules, and lymphatic glands. Hence, I am persuaded, no systematic history of the symptoms connected with this morbid state can be given in the present state of our knowledge; and I shall therefore merely content myself with an analysis of those observed in the cases recorded.

Of the thirty-five cases which are given in the preceding pages, leucocythemia was demonstrated to exist, by careful microscopic examination, in twenty-five. The facts presented by these may be afterwards compared with those offered by such cases as were doubtful, or by those in which, associated with large spleen, it was proved that the blood was quite healthy.

Sex.—Of the twenty-five cases, sixteen occurred in males and nine in females.

Age.—The youngest case in which leucocythemia was observed was in a girl aged 9, and the oldest in a woman aged 69 years. In two cases the ages are not stated, but in the remaining twenty-three they may be arranged as follows:—Under 10 years, one case; between 10 and 20, two cases; between 20 and 30, three cases; between 30 and 40, seven cases; between 40 and 50, four cases; between 50 and 60 three cases; and between 60 and 70, three cases. So far as this analysis goes, the disease would appear to be most common in adult life, and more frequent in advanced age than in youth.

Abdominal swelling.—Greater or less swelling of the abdomen was

present in twenty out of the twenty-five cases,—evidently dependent, in the majority of these, on enlargement of the spleen and liver, singly or united. In five cases ascites was also present. In several of the cases these was more or less abdominal pain or tenderness, while in a few the enlargement only produced inconvenience, from its size or weight.

Respiration.—The respiration was more or less affected in twelve out of the twenty-five cases. Of these dyspnœa existed in eight. The respiration is said to have been hurried in one; short in a second; laborious in a third; and slow in a fourth. The disordered respiration appeared to be dependent in some cases on enlargement of the abdomen, and corresponding compression of the pulmonary organs, in others (five cases) it may have resulted from disease of the lungs themselves.

Vomiting was present in seven cases. In two at the commencement, in three it was occasional, in one there was hematemesis, and in one it was connected with ulcer of the stomach.

Diarrhœa was present in twelve cases, and in some was the leading symptom throughout the progress of the disease. In Tinlay, for instance (Case 2), during the six months he was in the Infirmary, the bowels were opened from eight to twelve times a-day for weeks together. In other cases this symptom only came on latterly, and in a few was not urgent.

Constipation is said to have existed in five cases.

Hemorrhages.—Extravasation of blood occurred in fourteen out of the twenty-five cases. Of these there was epistaxis in six cases; hematemesis in one case; hemorrhage by stool, including hemorrhoids, in four cases; hemoptysis in one case; flooding after delivery in one case, and bleeding from spongy gums in one case. In some of these cases bleeding from the gums or bowels was associated with epistaxis, and this last symptom was observed in some of the best marked cases of the disease, with enlarged spleen.

Dropsy was present, more or less, in thirteen cases, generally dependent on the abdominal tumour. There was anasarca in two cases, ascites in four cases, and œdema of the lower extremities in seven cases.

Fever.—More or less fever was observed in eleven cases, indicated by increase of pulse, loss of appetite, thirst, and heat of skin. It was occasionally present at the commencement, at other times at the termination of the disease. In no case did it exist to any extent, or was long continued. From the frequency of splenic enlargement, it might be supposed by some that the disease was connected with intermittent fever, but that this ever occurred is very doubtful. It is said to have preceded the disease in three cases. In Case 8 the report says, that four months previous to admission there had been intermittent fever, but Dr. Walshe adds, "this point was not sufficiently inquired into. In Case 10 there had been repeated attacks of ague, the last of which occurred nine years before he came under observation, and seven years before the abdominal tumour was perceived. In Case 19 the patient also had laboured under intermittent fever, but seventeen years previous to the commencement of the abdominal swelling. So far as the recorded

cases are concerned, therefore, there is every reason to believe that intermittent fever is in no way concerned with the production of leucocythemia.

Palor of the surface.—An unusual palor of the surface was observed in many cases, resembling that of anemia. The conjunctivæ, also, were of a peculiar light blue tint.

Jaundice.—In one case only of all those in which the liver was affected, was jaundice observed.

Emaciation.—In most of the fatal cases emaciation was extreme.

Complications.—Disease of the lung was present in five cases, including one case of bronchitis, one of phthisis, and three of pneumonia. Bright's disease existed in two cases,—cerebral hermorrhage in one case; cancer was present in three cases,—in one, in the form of an undescribed abdominal tumour (Case 10), in a second, there was cancer of the thyroid body and neighbouring lymphatics, and in a third, cancer of the liver, with ulcer of the stomach, stricture of the urethra, and hydrocele. All these diseases were characterised by their peculiar symptoms, or physical signs during life.

It must not be supposed that the above numerical account of the symptoms exhibits even an approximation to the proportion which any particular one holds to the number of cases on record. Owing to the imperfection with which many of these are described, important symptoms in some not being even alluded to, this is obviously impossible. Statistics are no more applicable to this subject than to any other in medicine, where the cases have not been expressly drawn up in reference to such an inqury.

II.—*Condition of the Blood in cases of Leucocythemia.*—Of the twenty-five cases of undoubted leucocythemia, it was detected after death only, in ten ; during life only, in six ; and both during life and after death, in nine cases. Thus it has been detected in the living body in fifteen cases, and in the dead body in nineteen cases.

On examining the blood of living persons (which is most readily accomplished by extracting a drop from the finger by pricking it with a needle, and then examining it between glasses under the microscope in the usual way), the yellow and colourless corpuscles are at first seen rolling confusedly together, and the excess in number of the latter over the former is at once perceived. This, however, becomes more evident after a short time, when the coloured bodies are aggregated together in rolls, and leave clear spaces between them, which are more or less crowded with the colourless ones. Means are altogether wanting to enable us to determine with exactitude the relative proportion of the two kinds of corpuscles in different cases. In some the colourless corpuscles are only slightly increased beyond their usual number. In one case they are described as five times as numerous as those in health. They are also said in particular instances to be "greatly increased," "one-third as numerous," and "as numerous" as the coloured corpuscles. In all these statements there is nothing exact. Perhaps the best method of judging is to regard the spaces or meshes left between the rolls or aggregations of yellow blood corpuscles. When these are completely filled up, the colourless bodies do not, in fact, amount to one-third of the coloured

ones, on account of the large number of the latter which may exist in a small space, in the form of rouleaus.

The size of the colourless corpuscles in the various cases given differs considerably. Even when at first sight they appear to be of tolerably uniform size in any one case, it may be observed, when they are magnified highly and carefully measured, that some are twice the size of others, with all the intervening sizes between them. In some cases, though comparatively few in number, they are described as being three or four times larger than the coloured corpuscles, and in two cases recorded, they were in one about the same size, or somewhat smaller, and in the other of two sizes, one larger and the other decidedly smaller.

In the nineteen cases in which the blood was carefully examined after death, the same variations with regard to number and size of the colourless corpuscles were found to exist, as have just been referred to in blood drawn fresh from the finger. It was always observable, however, that they were most numerous in the clot; and when they existed in any number, as in Cases 1 and 2, they communicated to the colourless coagulum a peculiar dull, whitish look, and rendered it more friable under pressure. When less numerous, portions of the colourless coagulum from the heart and large vessels might be seen to present a dull cream colour, easily distinguishable from the gelatinous and fibrous appearance of a healthy clot, and such altered portions always contained a large number of the colourless bodies. This was especially observable in Case 34.

There is one remarkable fact which has been strongly impressed upon me by careful observation of the preceding cases. In no one instance has the condition of the blood been observed to undergo any marked change after the excess of white cells in it was discovered. In no case has this condition of the blood been seen to appear and progress gradually, as is observed in so many other lesions. In the case of Tinlay (Case 2), the patient was under medical observation for a period of eighteen months, and the same excess of colourless corpuscles existed at the end of that time, as at its commencement. In the case of Kerr (Case 19), the corpuscles were only slightly augmented in number, and yet at the end of eleven months they were not more numerous than when first examined. Cases are still to be met with, therefore, in which the commencement and progress of leucocythemia are to be observed. Such can only be expected to be found when the microscopical investigation of the blood is more generally practised in clinical investigation, as it is commencing to be in the Royal Infirmary.

III. *Chemical Composition of the Blood in cases of Leucocythemia.*—The chemical analysis of white cell-blood has been undertaken in only five cases, a number far too few to arrive at any important results. One cause of this is, that the majority of the twenty-five undoubted cases were only discovered after death, when any analysis of the blood in reference to the relative proportions of all its constituents cannot be determined. Another cause is owing to the circumstance, that several of the cases observed during life were so weak and exhausted, that the abstraction of even two oz. of blood, for the purpose of analysis, could not be safely ventured upon. Of the five analyses, three were performed by

Dr. William Robertson of Edinburgh, one by Dr. Parkes of London, and one by Dr. Strecker of Giessen. Dr. Robertson also analysed the blood of a sixth case (Case 28), in which there was enlargement of the spleen without leucocythemia. The following is a tabular view of these analyses, the inferences from which will be given on a future occasion:—

Analyses of the Blood.

Case.	Sp.Grav.	Sp.Gr. of Serum.	Fibrin.	Serous Solids.	Globules	Total Solids.	Water.	
No. 2.	1041·5	1026·5	6·0	72·0	67·5	145·5	854·5	Leucocythemia
3.	1036·0	1023·0	2·3	67·0	49·7	119·0	881·0	
8.			7·08	75·22	101·63	183 93	816·07	
Later analysis			4·75	77·52	97·93	180·2	819·8	
19.	1049·5	1029·0	5·0	95·0	80·0	180·0	820·0	
29.			4·46	82·35	97·39	184·2	815·8	
28.	1042·0	1025·5	3·9	75·7	76·3	155 9	844·1	

IV. *Morbid Anatomy of individuals affected with Leucocythemia.*—Of the twenty-five undoubted cases of leucocythemia which have been recorded, the body has been examined after death in nineteen. The information obtained from this source may be still further extended by a consideration of four cases in which the existence of this condition of the blood is highly probable; of seven cases recorded by Dr. Hodgkin of enlargement of the spleen and lymphatic glands, and of two cases examined after death where the spleen was hypertrophied without leucocythemia. In all, thirty-two dissections.

The organs which have been found to be most uniformly diseased are the spleen, the liver, and lymphatic glands, and of these I shall speak separately. The other lesions found in the brain, lungs, heart, kidneys, &c., alluded to in Section I., under the head of complications, were evidently accidental or consecutive, and need not be alluded to especially, in this place.

Condition of the spleen.—Of the nineteen cases of leucocythemia in which the body was examined after death, the spleen was found to be more or less enlarged in sixteen. In the other three, although it was healthy, the pulp in one, is said to be "a little more compact than usual;" in a second its condition after death is not alluded to, although an encephaloid tumour occupied the left side of the abdomen; and in a third, the spleen was "healthy."

Of the sixteen cases in which the spleen was increased in volume, it weighed above 7 lbs. in three; above 5 lbs. in two; above 3lbs. in two; above 2 lbs. in four; and nearly 1 lb, in one case. In four cases it was not weighed. The greatest weight of a spleen was 7 lbs, 13 oz., and the largest measurement 16½ inches long, and 9½ inches broad. The texture of the organ varied in different cases, in some being of unusual density, in others natural, and in a third class more or less soft and pulpy. In a few cases it contained yellowish masses, apparently a form

of deposit, but in reality degenerated tissue. The structure was examined microscopically in seven cases, in all of which it was demonstrated that the cell and nuclear elements were increased, while the fibrous portion of the organ was apparently normal.

In four cases in which the existence of leucocythemia is probable, changes similar to those just stated occurred in the spleen, and in Dr. Hodgkin's cases similar lesions were found associated with enlarged lymphatic glands.

It is clear, however, that mere enlargement of the spleen is not necessarily connected with white cell-blood, for in case 27 it was simply hypertrophied and weighed three pounds and a half; and in numerous other cases where this organ has been undoubtedly enlarged, it has been proved by careful examination that the blood was normal—(Cases 26, 28, 35.) It remains to be ascertained what are the structural differences in the spleen existing between cases like these last, and those in which leucocythemia exists.

Condition of the liver.—Of the nineteen cases examined after death, the liver was diseased in thirteen. In the other six it is distinctly stated to have been healthy in five, while in one it is not noticed in the report.

Of the thirteen cases, the liver was cirrhosed in two,—one in its incipient and one in the advanced stage of that disease. In a third case there was cancer of the organ, and in the ten others the liver was more or less hypertrophied. Of these it weighed above 13 lbs. in one; above 12 lbs. in one; above 10 lbs. in one; above 6 lbs. in three; and above 5 lbs. in two cases. In two cases, though much enlarged, the weight is not stated. In these cases the organ was more or less congested, and its consistence varied from great firmness to a degree of softening amounting to diffluence. The minute structure of the liver was carefully examined in four cases, and found to be unaffected in three, while in the fourth it was infiltrated with cancerous exudation.

In the six probable cases of leucocythemia, it is said that the liver was greatly hypertrophied in four. In the other two its condition is not stated.

Condition of the lymphatic glands.—Of the nineteen cases examined after death, the lymphatic glands were more or less diseased in eleven. Indeed, it is very probable that they were affected in a larger number, as in most of the other cases they were in no way alluded to, and may possibly have escaped observation from an unacquaintance with the importance which, as we shall see, ought to be attached to them.

Of the eleven cases, the lymphatic glands throughout the body were greatly enlarged in four, and more or less cancerous in three others. The mesenteric glands were especially affected in two; the thyroid and epigastric glands in one; and the solitary and aggregate intestinal glands in one. In some cases they were soft, presenting on section a a granular whitish appearance, and yielding a copious turbid juice on pressure. In other cases they were more indurated; and in one there were slight calcareous deposits. The glandular structure was carefully examined microscopically in eight cases, and in all exhibited increase of the normal tissue, the juice abounding in cell or nuclear elements. In

two cases, cancer cells were mingled with the healthy textures of the glands.

In the 17th vol. of the Medico-Chirurgical Transactions, Dr. Hodgkin has recorded seven cases in which the lymphatic glands were more or less enlarged, and at the same time associated with increased size of the spleen. He considers the enlargement of both structures to be allied, and to depend upon a primary lesion unconnected with inflammation or adventitious structures. The appearance of a bloody serum in the thoracic duct and absorbents struck him in two of these cases, but the blood itself was not apparently noticed. At the time Dr. Hodgkin wrote (1832) the microscope was not much employed in pathological investigation, but had the blood been examined in these cases, I cannot resist the conviction that the discovery of leucocythemia would not have been reserved for the year 1845.

In the concluding portion of this memoir, it will be my endeavour to establish from the foregoing facts, and from numerous other observations and experiments :—

1. That the coloured blood-corpuscle is derived from the colourless one.

2. That the colourless blood-corpuscles are derived from the glands of the lymphatic system.

3. That the lymphatic glandular system is composed of the spleen supra-renal capsules, thyroid body, thymus (pituitary, pineal?) and lymphatic glands, and that these constitute an extensive apparatus for the formation and elaboration of blood-corpuscles.

4. That the fibrin of the blood is derived from the solution of the blood-corpuscles, and the effete matter resulting from the disintegration of the tissues.

5. That these propositions concerning the origin, development, and disintegration of the blood-corpuscles are now as a consistent theory advanced for the first time, receive proof of their correctness from the cases of leucocythemia previously detailed, and are in harmony with the facts elicited by the labours of Hewson, Nasse, Wagner, Richert, Gulliver, Zimmerman, Wharton Jones, Simon, Kölliker, Milne Edwards, Goodsir, and others.—*Monthly Journal of Med. Science, Oct.* 1851, *p.* 328.

8.—ON THE PREVENTION OF SCROFULA OR STRUMA.

By Dr. Shapter.

[In an essay upon this subject, Dr. Shapter makes the following most judicious and valuable remarks:]

There are three points to be particularly attended to in the prevention of scrofula. 1. Where a taint of the disease evidently exists in the mother, that the state of her health during the period of utero-gestation should be regarded with the most jealous care. 2. That on the birth of the child, if either parent should have strumous predisposition, prophylactic means must be resorted to during the early years of life.

3. In cases where there is no hereditary predisposition, but locality or other external agents appear the sources of the disease, these must be obviated. Females are not, for the most part, sufficiently impressed with the influence exercised by their own state of health during pregnancy on the offspring they are carrying. This applies generally; but when the system is imbued with disease, the fœtus is in a condition to receive any morbid impression much more easily. It would be useless here to lay down any series of rules. Particular stress, however, may be laid upon the necessity of sufficient clothing, exercise in the open air, avoiding heated rooms and late hours, and abstaining from an indulgence in a full, stimulating diet. On a child being born of strumous parents, every means should be taken, as regards food, air, clothing, &c., to strengthen the general health, and to counteract the hereditary tendency. Should the father only be imbued with the strumous habit, and the mother in every way a proper person to nurse her own offspring, the infant should by all means derive its nourishment from her in preference to a stranger. If, however, the mother be scrofulous, a young healthy nurse should be substituted, and for the first six and seven months the infant should be entirely nourished from the milk so afforded; in the succeeding three or four months the addition of other light and nutritious food should be resorted to, in addition to that of the breast.

It is absolutely necessary that the wet nurse should not have given suck to her own child above a few weeks, or rather days, previous to the one she is to nurse; and during the whole period of her supplying milk, she, as well as the infant under her charge, should occupy large and airy rooms, and should take regular exercise in the open air, attending especially to the state of the digestive functions. A very common error prevails, that women, during the time they are fulfilling this function, should take in more nourishment than is their usual custom, and that it should be of a more stimulating and heating nature. About the age of ten months, or, at the latest, twelve, the infant should be weaned. Nothing conduces so much to produce a feeble frame of body as protracting the period of nursing. The milk, after twelve months, becomes poor and innutritious, causing in the child fed with it flatulence and indigestion.

The food at this period should, in great measure, consist of cow's milk, together with light nutritious matters taken from the vegetable kingdom, with some very slight addition of broth. Dr. Paris strongly recommends milk impregnated with the fatty matter of mutton suet. It is prepared by enclosing the suet in a muslin bag, and then simmering it with milk. Where it is an object to introduce much nutritive matter in a small space, he is not acquainted with a better form of aliment, ('On Diet,' p. 220). Dr. Cumin, who has made trial of it, fully bears out this recommendation, and says that it has a near resemblance to goat's milk, but that it has the advantage of being more astringent. He found it to be very useful in cases of scrofulous marasmus, when almost every other article of diet caused irritation of the bowels, and passed through them undigested.

The clothing of infants is of great importance. Dr. Edwards has shown that they neither have the temperature of adult age, nor enjoy

the power of generating heat to the same extent. The practical applications which result from his observations are of the highest importance. He says, with great justice, that if the attentions which children require in climates and seasons little favourable to the preservation of their existence were generally understood, and put in practice, it would considerably reduce one of the most powerful sources of mortality affecting that age in our climate. (This doctrine applies with equal, if not tenfold force, with regard to lunatics of every age.—W. S.) Cold operates much more generally than is supposod, and often affects the constitution most seriously, even when its effects are not manifested by any immediate sensations. They do not feel the cold, but they have an uneasiness or an indisposition, which arises from it; their constitution becomes deteriorated by passing through the alternations of health and disease, and they sink under the action of an unknown cause. It is the more likely to be unknown, because the injurious effects of cold do not always manifest themselves during, or immediately after, its application. The changes are at first insensible; they increase by the repetition of the impression, or by its long duration; and the constitution is altered without the effect being suspected" (Edwards, op. cit. p. 265). In those countries where, from the degree of cold, its effects are more sensible than with us, the necessity of guarding their children against its influence is fully appreciated. The result is, that. in these colder climates, this agent is a less frequent cause of mortality than amongst us. At the same time that it is necessary to watch the progress of the seasons, and to guard against the injurious effects of their climate, it is also of consequence to promote that state of the system which is favourable to the generation of animal heat, in order to compensate for the abstraction of of it by radiation, the temperature of our climate always making this a condition of our existence. This is effected by maintaining the organs of respiration and circulation in a state of vigour. The chief means which we have of promoting this, are exercise in the open air, living in apartments where ventilation is good, and the maintaining a healthy condition of the surface of the body: immersion in cold water is useful to this end,

The importance of fresh air cannot be too strongly inculcated. The rooms occupied by those of a strumous tendency should be large, airy, well-ventilated, and not over-inhabited; of all things the child shoutd not be confined in a cot or bed surrounded by curtains. The child of a country labourer, with everything against him, except that he enjoys fresh air, exhibits a vigour of health and appearance that is in vain looked for in those nurtured in the confined atmospheres of the nursery. Fresh air gives tone to the skin, vigour to the respiration, and conduces in great measure to a healthy state of the digestive organs.—*Med. Gazette, June* 13, 1851, *p.* 1021.

9.—*On the Treatment of Scrofula as it affects the External Lymphatic Glands.*—By T. Balman, Esq.—The best application for almost every kind of scrofulous sore is certainly the iodide of lead ointment: the ung. hyd. nit. oxid. is more stimulating for some very indolent and flabby

sores; but the former has generally succeeded with me so well that I now seldom use any other.

The disposition to scab seems very remarkable in all these kind of sores; and however beneficial this process may be in other wounds, it very nearly always tends to impede, rather than otherwise, the healing of scrofulous ulcers, not only by preventing granulations from forming, but, by allowing the ill-conditioned materials to accumulate and fester under it, causes further destruction to the subjacent tissues. I have generally, therefore, directed a poultice to be applied until the sore becomes clean, and then endeavour to prevent their reproduction by some of the stimulating applications already alluded to. I have used a cataplasm composed of bran, linseed, and common yellow soap, with very good effect in these cases.

Seeing the tedious and protracted nature of these sores, and the deformity that almost always attends the healing of the wound under the most favourable circumstances, points out to us the desirability of endeavouring to prevent an abscess from forming, and to use all the means within our reach, both general and local, calculated to disperse the swelling prior to its arriving at that stage when the elimination of the morbid products by suppuration becomes inevitable. This leads me briefly to notice some of the means by which this object may sometimes be accomplished.

We have observed, in the first part of this communication, that these glandular swellings are met with under a great variety of circumstances. The patient may, for example, present the fine, delicate, white skin, the tumid lip, and crimson hue of cheek, and the languid, listless, and enfeebled gait so familiar to us in persons possessing the well-marked lymphatic temperament; or all these signs of the strumous constitution may be for the most part wanting, and we have the outward characters of a sound and vigorous constitution; or there may be evidences of a previously acquired syphilitic taint sufficient to justify our pronouncing this to have been the primary *exciting* cause of the disease. A disease, therefore, occurring under so many and varied aspects must of necessity require different modes of treatment. If, for instance, the swellings appeared for the first time after an attack of primary syphilis, the iodide of potassium and sarsaparilla will be found the best remedy, all other remedies, as far as my experience goes, being perfectly useless.

I have made trial of most of the reputed antiscrofulous remedies, and must confess with very indifferent results. The following, however, deserve some notice:—mercury, barium, iodine, alkalies, cod-liver oil, &c.

Mercury.—Of the different preparations of this metal I have commonly preferred the hyd. c. cretâ and the bichloride. The former may be given, in combination with rhubarb and magnesia, as an alterative aperient, every other night, or oftener, according to circumstances. The benefit accruing from some simple combination of this kind, by improving the secretions, and giving tone to the digestive mucous surfaces, is often very striking; and, indeed, it is not uncommon to see some of the milder descriptions of cases get well by a short continuance of these medicines alone. It should, I think, precede every other kind of treatment. The bichloride I have given in doses of 1-16th to 1-20th of a grain dissolved

in distilled water, or in the form of a pill, with the ext. of sarsa, twice or thrice a day. I have seen it of use in glandular swellings complicated with some of the more obstinate forms of scaly cutaneous disease, and particularly psoriasis. Under these circumstances, and provided the general health be good, this preparation may be given with advantage. It sometimes rapidly causes the absorption of the intervening cellular tissue, by which several isolated tumours are often aggregated into one firm resisting mass; and here its beneficial operation seems to stop, the glands themselves being seldom completely dispersed by this remedy, however long continued. In irritable subjects it rapidly brings on suppurative inflammation, and this may be said to bring the case to a close earlier than otherwise might have happened.

Barium.—I have made trial of this remedy, so much extolled by some of the old writers, and am disposed to entertain a very favourable opinion of its efficacy, particularly in chlorotic, cachectic, and other cases attended with a languid circulation and much general debility; it seems, therefore, well adapted for females of a lymphatic temperament and attended with any irregularity of the menstrual function. I generally use it in combination with the muriated tincture of iron. ℞. Baryta chlorid. gr. x.; tinct. ferri mur. ʒij. to ʒss.; syr. aurantii vel aq. destillat. ℥x.—Mix; of this half an ounce to an ounce may be given two or three times a-day.

Cod-liver oil has appeared to me to exercise little or no influence upon the great majority of external glandular tumours. It must, however, be admitted that it is a potent and most valuable remedy in some forms and complications of the disease: when associated with caries of the bones or phthisis, for instance, I almost invariably order the oil, as exercising a most beneficial influence in both these cases. Again, in many of those boggy and unhealthy sores which are observed to remain unchanged for a very long time, and are usually covered with a thin dry crust, which, on being removed, exposes a pale, soft, flabby ulcer, exuding a thin, grumous, unhealthy looking matter; I have often observed these kinds of sores get well by a lengthened continuance of the cod-liver oil, having previously resisted most other remedies. Whatever may be the rationale of its operation, there can be no doubt but that it supplies to the blood, and thence to the different tissues of the body, very important nutritive materials which were previously wanting. Where, for instance, we see a sore exuding a thin colourless fluid as transparent as water, alkaline, and coagulating on the application of an acid, consisting of little else than the serous and watery portions of the blood, which we have seen to be so abundant in this fluid, incapable, therefore, of cell growth and the production of new tissues, from a deficiency or imperfect assimilization of that higher organised material, the fibrine: if, under these circumstances, cod-liver oil, or any other agent, causes the sore to throw up healthy granulations and get well, it must be by supplying the blood with a more highly vitalized pabulum, which, by increasing the red corpuscles, substitutes for the serous and watery blood-liquor a plasma more in accordance with what we know to be the healthy and standard condition of this fluid.

Alkalies have for a long time been reputed as valuable anti-strumous

remedies, and have been recommended very recently by some very high authorities. This has doubtless arisen in some measure from some partiality for, or the belief in, the antiquated doctrine which assumes that there is some specific acid principle pervading the animal fluids which determines the development of the disease. It is hardly necessary to state that this is a mere hypothesis; and I have by some attention to this point, satisfied myself that there are no grounds whatever for believing that an excess of acid of any kind is generated either in the chylopoietic viscera or eliminated from the system with the different excretory products. It is quite true that the irregular appetite, bad digestion, and vitiated alvine discharges, do frequently in childhood precede the early manifestations of scrofula, and seemed to point out the probability of there being an excess of acid generated in the primæ viæ; but it by no means follows that this should be one of the most important features of the disease. Not only on these grounds, but from practical experience, I have come to the conclusion that little benefit will result from any lengthened persistence in this class of remedies; on the contrary, I am disposed to believe that they are sometimes absolutely injurious, by deteriorating still more the already too impoverished blood. In proof of this I may mention that, during the trial I made with the various alkaline preparations reputed to cure scrofula, I observed in many instances one of the commonest complications of this disease to appear: I allude to ophthalmia, which as speedily yielded to the opposite treatment.

Iodine, either alone or in combination with potass, has succeeded but indifferently in my hands; and I believe it will be found that the value of this substance has been much over estimated. The iodide of iron, however, is a very excellent preparation, and may be given either alone or in combination with cod-liver oil.

Phosphoric acid.—In one of my former communications I casually alluded to phosphoric acid as a medicine which I had seen to exercise a very beneficial effect in a considerable number of cases. Since this period I have steadily watched its operation upon a more extended scale, and I do not hesitate to assert that, as a therapeutic agent, it will be found in no degree inferior to any before mentioned. Its effects are sometimes very marked in some of those obstinate forms of strumous conjunctivitis which we know will sometimes resist for a long time every kind of treatment, and at other times will quickly disappear under the influence of some simple local application, but perhaps as speedily return under the slightest exciting cause. In these (if one may so express it) intermittent forms of ophthalmia arising in a scrofulous constitution I have found this medicine of especial service, not only in completely removing the disease, but also in preventing its recurrence. I am in the habit of giving it in the infusion of columbo, commencing with five minims of the dilute acid of the Pharmacopœia, gradually increasing it to twenty or more. This combination seems to agree very well with the stomach, and, unlike most other mineral acids, may be continued for any length of time without producing any unpleasant effects. Whether its beneficial effects are confined to its tonic influence, or exercise some more specific influence upon the blood and system generally, I do not know.

As regards the treatment of scrofulous swellings, I believe that much harm is sometimes done by the indiscriminate use of frictions with the iodine ointment and other compounds, by inducing a low form of inflammatory action in the skin and integuments, and the chance of bringing on suppuration which it is desirable in many cases, for reasons before stated, to prevent. On this account, and also from the fact that the action of all such applications is very feeble in dispersing the tumour under any circumstances. I seldom now have recourse to them.

In the absence of all signs of inflammatory action after a trial of some of the foregoing internal medicines, I prefer, as a counter-irritant, pencilling the part with the solid nitrate of silver a few times, at intervals of a week or ten days. This, I think, is a milder and safer proceeding than the use of blisters, the action of which is more diffusive and irritating.

It is hardly necessary to insist upon the utmost attention being paid to a variety of circumstances regarding the general management of scrofula; such as good and wholesome food, good air, sea-bathing, exercise, and various other hygienic means, which are known to exercise the happiest effects in every form and variety of this disease; and, if trusted to alone, would, I am persuaded, in many instances give the patient as good, if not better, chance of getting rid of this most intractable disease. —*Med. Gazette, Aug*, 22, 1851, *p.* 323.

10.—*On the Treatment of Small-Pox.*—By Joseph Grosvenor Pasquin, Esq., Birmingham.—[After mature deliberation upon the treatment of small-pox, Mr. Pasquin arrived at the conclusion that the pitting and disfigurement of the face was dependent upon the confinement of the matter too long in the pocks, causing a slough thereby to form in the cellular tissue lying between the cuticle and the fascia of the face. This is not regenerated, hence the cuticle falls into the space where the cellular tissue is then wanting, and thus follows the pitting. To obviate this, Mr. Pasquin determined to puncture each pock previous to its arriving at perfection, and apply a common poultice. He adds:]

I have had seven cases, four wherein the larynx was not at all affected, on which I tried the experiment of puncturing every pock on the face, and afterwards applying repeated poultices. This treatment succeeded to my utmost satisfaction, the face being left as clear of marks as it was previously to the attack of small-pox. I had three more with affection of the larynx, the respiration being so difficult that I expected asphyxia would come on in a few hours. To these I applied leeches over the region of the larynx, and on the following morning, I found the respiration had become perfectly free and easy.

One of the three cases last reported is that of D——, labourer. This was the worst case of confluent small-pox I ever witnessed in the whole course of my medical career. He was, in the early stage of the disease, attacked with great difficulty in breathing; his tongue, soft palate, pharynx, and larynx, as far as I could see, being covered with pocks. I

applied leeches at night, and on the following morning his breathing was perfectly free and easy. His face was so completely covered with pocks, that I could not find one space over his whole face, sufficient to lay on a grain of sand, which was uncovered by any pock. In this case I punctured as many pocks as I could myself, and requested his mother and sister to puncture the remainder. He is now up, and doing well, and he has not a mark upon his face.—*Lancet, July* 12, 1851, *p.* 30.

11.—ON CANCER-CELL.

(From a Review of Dr. Lebert's Treatise on Cancerous Diseases.)

[In reviewing M. Lebert's work, the Reviewer asks What has the microscope really accomplished? Have we been enabled by it to detect the nature and structure of cancerous growths with greater certainty than we could before? To this an affirmative may be given, although a discrepancy exists as to the element or elements by which this is done. It, perhaps, may be said to be more apparent than real.]

In his 'Physiological Pathology,' M. Lebert thus expresses himself:—"The cancerous globule has decided characters which distinguish it from every other kind of morbid production." This proposition is repeated in the same volume, in the following words:—"The cancerous globule is the part which distinguishes cancerous tumours from all other morbid productions." Now if the cancer-cell really had characters so distinctive, nothing of course could be easier than to determine the nature of cancer. But it is denied by other pathologists that such is really the case; and it is especially pointed out by Dr. Bennett (on 'Cancerous and Cancroid Growths'), that isolated epithelial cartilage, and fibro-plastic cells may, under certain circumstances, so closely resemble cancerous ones as not to be distinguished from them. Now if this latter proposition be true, the value of M. Lebert's statement at once vanishes when it is most required. On the other hand, it has been contended that groups of cancer-cells can, in the majority of cases, enable us to form a correct conclusion, especially when attention is paid (as should invariably be done) to their relation to the accompanying elements of the growth. These and similar observations seem to have made an impression upon M. Lebert; for without acknowledging a change of opinion, he now expresses himself as follows:—"An isolated cell being given, can we always recognize, by microscopic examination, if it belong to a cancer or no? We do not hesitate to answer *in the negative.* But the question we have always endeavoured to resolve is this,—a morbid tissue being given, can we recognise, by means of a microscopic inspection, if it be cancerous or not? On this point we do not hesitate to answer in the affirmative."

It follows, therefore, that M. Lebert has greatly modified his views on this essential point. He no longer attaches the same importance to the cancer-cell as a means of diagnosis; but considers this element, in conjunction with those others which make up the morbid tissue, to constitute the only foundation for a sound anatomical ground of diagnosis. Whilst, then, M. Lebert is now brought to agree in the accuracy of Dr.

Bennett's opinion, he accuses the latter pathologist of holding a view which he never dreamt of, and enters into a laboured argument to show that he, as well as Vogel and Virchow, denying the specificity of the cancer-cell. In other words, he has confounded together two very different questions,—viz., the diagnostic character of a cancer-cell; and the theoretical opinion as to whether one cell can be transformed into another. But even here he has mistaken Dr. Bennett's language, who distinctly says, after arguing this question, "It may therefore be doubted whether the true cancer-cell *be ever* formed by transformation of a previously existing one."

It results, however, from this criticism, that notwithstanding the confusion pathologists are led into from differences in modes of expression, and from incorrectly appreciating the idioms of a language with which they are not very familiar, that the discrepancies existing in various works published in England, France, and Germany, are, as we have previously seen, more apparent than real: more verbal than essential. Indeed, there can be no doubt that the results of microscopic observation are now tolerably uniform amongst accurate histologists in all countries; and that the microscope is daily becoming more necessary, not merely as an instrument of scientific research, but as a means of diagnosis.

Another point of importance in the present state of our knowledge is, what we should understand by the term "cancroid." This term has been extended to all growths which are capable of being mistaken for cancer. In such a sense it is evidently provisional, inasmuch as no sooner do our means of distinguishing these become more certain, than they cease to resemble cancer. This applies to fibrous, sarcomatous, tubercular, and other growths, which are still too frequently confounded with cancer by surgeons. On the other hand, we conceive it to have been distinctly proved that there is a class of growths essentially differing from cancer in structure, and yet which has a tendency to return, to attack the lymphatic glands secondarily, to soften, ulcerate, and kill; in short, to present all the characters usually grouped together under the term "malignant." To this class belong certain epithelial, cartilaginous, and fibro-nucleated growths, and probably other forms which have not yet been described.—*Monthly Journal of Med. Science, July*, 1851, *p.* 51.

12.—CASE OF ACUTE GLANDERS—RECOVERY.

By Dr. W. F. Mackenzie, Fellow of University College, &c.

[It is generally admitted that glanders may be communicated from the horse to man. The following case is an example in proof. William Wilcox, a horsekeeper, aged 58, was admitted into the Paddington Infirmary on the evening of the 19th of July. His face generally was swollen and suffused; especially in the submaxillary region. A large quantity of saliva was pouring from his mouth, his breath was extremely fœtid and sickening, his gums were swollen, his teeth were loose, and his nostrils were filled with a thick glutinous secretion, which was with difficulty removed. From destitution he had been accus-

tomed to sleep in stables, or wherever he could get a shelter, and from this circumstance he had undertaken the charge of some glandered horses at Islington. He got progressively worse, the swelling increasing under the jaw to an enormous tumour. He broke out into profuse cold sweats, but he had no rheumatic pains, nor any local affection of the face, nose, or salivary glands. Now this seems to be a case of acute glanders, and yet if so it differs from other reported cases, as neither ecchymoses, gangrene, or pustules were observable on the mucous membrane, neither was there any specific affection of the lymphatics or cellular tissue. The enfeebled state of his constitutional powers from previous destitution, seems to have been the chief predisposing cause. Next as to the]

Treatment.—In offering some remarks upon the treatment of the present case, I cannot introduce the subject better than by quoting the following passage from Dr. R. Williams's philosophical work 'On Morbid Poisons.' "All the remedies hitherto tried in acute glanders have failed, for only one out of fifteen has recovered, and that not from any particular treatment. Blood when taken at the commencement, has been found buffed, and some momentary relief has been afforded, but the bleeding ought not to be repeated, as in the more advanced stages the prostration is great, and stupor quickly follows, and leech-bites have become gangrenous. The coming on of typhoid symptoms has caused quina, valerian, serpentaria, ammonia, and other stimulating medicines to be exhibited, but all these experiments have failed; vomiting and purging have been likewise had recourse to, but these measures have been equally unsuccessful. In the present state of our knowledge of this disease, every experiment in treatment is warranted as the only chance of subduing a malady which has so constantly proved fatal. In the more chronic forms of the disease, the recovery of the patient has appeared rather to be owing to the excellence of his constitution, than to any powerful effect produced either by general or local treatment."

In the present instance, I had no reasonable expectation of the patient recovering, nor had he, or any one who was present at the time when I first saw him; and yet in twenty-four hours he was comparatively out of danger. Now this change cannot be ascribed to any improvement in his sanitary condition consequent upon coming into the hospital. For, in spite of wine and other assistance, he was worse then than when he was admitted. Hence I think that the improve- which took place must be mainly attributable to the treatment which may be thus recapitulated in the order of sequence. 1st. An incision in each of the Whartonian ducts. 2ndly. An emetic of ipecacuanha. 3rdly. Sesquicarbonate of ammonia in water hourly, as concentrated as it could be swallowed. 4thly. An opiate at bed time, with wine and nourishment, in such quantities as the patient could be prevailed upon to take.

The incision was made in the Whartonian ducts on account of their being much distended, and from an impression that their orifices were closed from the swollen state of their parietes. It gave immediate relief to the patient, by allowing a free escape of a large quantity of pent-up saliva, and the swelling and tension of the parts were at once

lessened by it. The emetic was considered to be indicated by the existence of gastric derangement throughout the progress of the case, which was manifested by a constant disposition to sickness, and the inability of the patient to retain anything upon his stomach. It was also given for the purpose of producing reaction; and rousing the constitutional powers by its operation upon the ganglionic nervous centres.

But the principal reliance was placed upon the frequent administration of the sesquicarbonate of ammonia *in a concentrated form.* This remedy, and this mode of exhibiting it, were suggested by the good effects which I had seen it produce when so given in the severe affections of the throat, which are met with in malignant scarlet-fever. It was originally recommended by Dr. Peart in such cases, in a work on the malignant scarlet-fever and sore throat, which he published in 1802; and its efficacy is corroborated by Mr. Wilkinson, who quotes also the testimony of Mr. Ricardo in its favour. As, however, the works in question are not very accessible to the profession, and as in the particular case under consideration, it appeared to have been most beneficial, and to have been the main cause of the patient's recovery, I shall add a few remarks upon the remedy as thus exhibited.

Ammonia is reported to have been given in glanders, but without success; and the same remark has been made with reference to its exhibition in scarlet fever; but it is not so much to the medicine, as to the method of giving it, that we are, I apprehend, to look for the beneficial results. On this point Mr. Wilkinson remarks:—"It has been observed that Dr. Peart has no claim to originality in the employment of the subcarbonate of ammona in the cure of scarlatina, Dr. Withering having used the same remedy many years before: but may there not be almost as much originality in the *manner* of exhibiting a remedy, as in the first adoption of it? Dr. Withering says, that the volatile alkali may likewise be given with advantage, but it is difficult to get a sufficient quantity of it swallowed (p. 84); and he prescribes it in the following form. ℞. Sal. absinth. ʒ ij; sal. vol. ammon. ʒ ss; aq. fontan. ℥ ij. M. Ft. solutio, to be put in a quart of white wine whey, and the whole to be taken in twenty-four hours; by which it appears to me that he knew little of the powers of subcarbonate of ammonia in this disease. His manner of exhibiting it would destroy its effects, or at least the effects upon which I should depend for its advantages in scarlatina." These remarks appear to me to be equally applicable to the treatment of glanders with ammonia, as it is ordinarily given.

On the other hand, it was an essential part of Dr. Peart's treatment of the scarlatina, anginosa and maligna, that it must be given in a state as strongly stimulating as it can be swallowed. His mode of exhibiting it is contained in the following passage, which is quoted from Dr. Willan. "He dissolves two drachms of the carbonate of ammonia in five ounces of water, and directs the patient to take two teaspoonfuls every two, three, or four hours, according to the urgency of the symptoms. If the difficulty of swallowing abate, and the patient wish for it, a little cold water may be added to each dose. Cold water or toast and water may be drank at pleasure. The above remedy was given in every form and in every stage of the scarlatina. "Some," he says, "were

glowing with universal efflorescence; in some the extremities were swelled; in others fetid ulcers appeared; in most the throat was swelled and inflamed, often ulcerated, and respiration almost prevented; but, in the most alarming cases, a scorching fever and raging delirium rendered the patient's situation horribly distressing. Yet, in all these variations of the disease, the volatile alkali was my specific, which I administered to between two and three hundred patients *successively and successfully.*" The immediate effects of the remedy are stated to be a diminution of heat, fever, and delirium, and a disposition to sleep. Mr. Wilkinson confirms the accuracy of these remarks; and, in regard to the *modus operandi* of the medicine, says, "I will take the liberty to state, that I depend not upon its diuretic nor its diaphoretic qualities, but believe that it possesses the power of increasing the strength of the arterial action, at the same time that it diminishes its frequency; that it supports the vis vitæ, without increasing the heat or irritability of the system, and by such means counteracts the tendency in the scarlatina, anginosa and maligna, to ulceration and sloughing, and all the other evils which sometimes attend this dreadful disease.

Mr. Wilkinson further gives the following practical illustration of the success which attended the treatment of scarlet fever in this way. "In the year 1803," he says, "I attended several cases of the scarlatina maligna with Dr. Willan and the late Dr. Hamilton. It is well known that the disease raged most fatally during that period; and we lost four of our patients out of five in one family. Never were men more puzzled to know what remedies to adopt. All which Dr. Willan has recommended in his publication were employed. Emetics, purgatives, calomel, and antimony, many other diaphoretics, opium, wine and acids, bark, blisters, decoct. contrajervæ, with oxymel of squills, application of cold water, gargles of different descriptions, fumigations, &c., all without the least good effect, all without making the least sensible impression upon the disease in any of its stages. About this time, Dr. Peart published his 'Practical Information on the Malignant Scarlet Fever and Sore Throat,' in which he describes the wonderful effects of the subcarbonate of ammonia, and considers it to be endowed with a specific power over that disease. Like other practitioners, he was continually lamenting the loss of his patients by that dreadful malady, till, by his own suggestion, he employed the subcarbonate of ammonia in the manner he describes; and from that moment he did not lose one patient, out of nearly three hundred. When I read this account, I immediately inquired after the character of Dr. Peart, and finding that he was most respectable both in talent and probity, and engaged in very considerable practice, I had no reason to doubt the truth of his statement, and therefore immediately adopted his remedy; and consonant with my own principle, that an effectual remedy for one genus, will, with proper management, cure all the genera of the same order, I administered it in all the following diseases—erysipelas, rubeola, scarlatina, urticaria, roseola, and erythema, with all their varieties; and I am happy to be able to declare, that from that moment to the present, a space of seventeen years, I have not only never lost a patient in the above diseases, but have never had a case of the kind that has even appeared dangerous, or that has given me a moment's anxiety."

In addition to his own, he adduces the following testimony to the remedial powers of ammonia, when so given, from Mr. Ricardo, of Bow, a gentleman of great ability, and very extensive practice: "I have received your letter, requesting me to state the result of my experience of the effects of subcarbonate of ammonia in the treatment of measles, scarlatina, and erysipelas. As I employed this medicine at your suggestion, many years ago, I lament that I have not placed on record any *particular* cases, many such having been under my care; but perhaps it may be sufficient for your purpose, that I am able to declare that the exhibition of subcarbonate of ammonia in such cases has been attended, under my direction, with constant success. You know that I am situated in the neighbourhood of many schools, which I have the pleasure of attending; and during twelve or fourteen years, in which I have employed the subcarbonate of ammonia, I have not lost a single patient, of some hundreds whom I have attended in the above diseases."

I have quoted these passages at some length, not only because the plan of treatment they refer to was adopted in the case of glanders which I have reported, with very striking results, but because I believe that the principle comprehended in it is applicable to many other analogous diseases, in which it has hitherto not been tried; and further, because I am anxious to do justice to those with whom the merit of originating it rests.—*Lond. Journal of Medicine, Sept.* 1851, *p.* 788.

13.—ON CHRONIC RHEUMATISM.

By Dr. John Cargill.

[The following paper, read before the Newcastle and Gateshead Pathological Society, comprises an analysis of 143 cases, 100 of which were treated by the nitrate of potash in large doses, and the remaining forty-three by colchicum.]

These cases have been treated during a period of nearly six years, *i. e.* between 1842 and 1848, and they have been nearly all in-patients of this Hospital, so that I have had them constantly under my own eye, the few not so situated having been out-patients.

I have compared the cases together under as equal circumstances as possible, and have endeavoured to attain as much accuracy as I could by carefully registering them at the time; this register comprises the following features:—Age, sex, duration of malady previous to admission, seat of pains, dose and combination of remedy, time of its employment, result, disturbing or other effects on the system, temperament of the patient, and concomitant treatment.

I shall first consider these points in reference to what was observed in the colchicum patients, and then in those treated by nitrate of potash, and shall conclude by recording certain deductions, which I think have unfolded themselves from the various facts, and likewise mention the views I entertain of the pathology and intimate nature of rheumatism.

Of the forty-three cases treated by colchicum, fourteen only were cured, or about one-third, and the average duration of the treatment

was fifteen and a half days; the average duration of the malady before admission being seventy-three days. In addition to the fourteen who recovered entirely, there were twelve relieved, whilst twelve remained no better. In one the complaint appeared to be worse, and in the other four, circumstances arose which prevented any positive conclusions from being arrived at.

Dose and combination of the Colchicum.—In rather more than half of those cured, that result was effected by the vinum seminum colchici in the dose of from fifteen to thirty drops thrice a day, with a little magnesia and sp. etheris nitrici. In a very few instances ten grains of Dover's powder were given a few times at bed-time. In six out of the forty-three, the colchicum was given in powder in four grain doses thrice a day; in one case it was given in six grain doses thrice a day, and in one case in two grain doses thrice a day, all combined with pulvis cretæ. In all but the last named it produced vomiting, griping, and diarrhœa in two or three days time, and had to be left off for the vinum with magnesia. Of this latter combination, the dose before mentioned, viz., ℥xv. to xxx. with fifteen grains of magnesia, and ʒss. of sp. eth. nit. was the most effectual, and the best borne. When the vinum was given by itself it seemed slower in its curative effect, and when given in ʒjss. doses or ʒj. doses thrice a day, either alone or combined (a measure in a few instances adopted), it invariably had to be left off, from its producing very speedily its usual severe physiological effects, with great depression, and often cramps, the disease remaining at the same time unaffected. I should add, that these results followed even when the above doses were attained to very gradually.

Concomitant treatment.—In seventeen out of the forty-three cases the warm bath thrice a week was used, and in fourteen out of this number manifest relief was obtained. In ten cases out of the forty-three, Dover's powder was given in from ten to fifteen grains each night, and in six of these cases it was followed by beneficial effects. Cupping was occasionally used, and generally with benefit. Bleeding from the arm was scarcely ever practised, and calomel, Epsom salts, blue pill, or colocynth, were used as preliminaries, if constipation existed. As to the seat of the disease, it was in the several joints and muscles. In four cases wherein the rheumatism existed along with sciatica as its chief feature, the treatment by colchicum was fruitless.

II. *Chronic Rheumatism treated by Nitrate of Potash in large doses.*—Of the 100 cases treated by this method, there were sixty-one cured, being more than six-tenths of the whole, and the average duration of the treatment was thirteen and three-quarter days. In addition to the sixty-one cured, there were twenty who experienced great relief, but were not entirely cured at the time of dismissal; there were five who experienced very slight benefit only, three received no benefit, and three got worse. In the remaining eight cases no positive conclusions could be arrived at.

Dose and combination of the remedy.—The usual dose to begin with was ℈ij. thrice a day in barley water; this was adhered to in many cases throughout, but in a large number it was increased to ʒj., ʒiss., ʒij., thrice a day, and in one case ʒiij. every four hours was begun

with and continued without intermission for twelve days, without the smallest inconvenience to the patient, who was cured in that period. This was a bad case of two and a half years' previous duration. The dose was often begun with and continued at ʒj., and with no disagreeable effect; sometimes ʒj. thrice daily, and sometimes ʒj. every four hours consecutively.

Being desirous of ascertaining whether the duration of the malady might be shortened, or good in other ways obtained by combining the nitre with sp. nit., antim., tart. and tinct. opii, I adopted this in a considerable number of cases, and the result has shown me that no advantage is derivable from this practice. The dose of sp. of nitre was generally from ♏xv. to ʒss. or more; that of the vin. antim. ♏xv., and that of the tinct. opii. ♏v. to each dose of the pot. nit. Sweating and diuresis were equally produced by the nitre alone as when given in the above combination. Of the three, the tr. opii alone appeared useful by frequently assuaging the severe pain.

Disturbing effects.—It is of great importance to remark that this remedy was invariably administered in a large quantity of warm barley-water—not less than ℥viij. to each dose. When given in the above large doses, without a diluent and demulcent like barley water, it produces intense griping, with pallor of the countenance and cold perspiration, the pulse and heart's action flagging and coming down, and the greatest anxiety being experienced. This is followed by a dry red tongue, with enlarged papillæ and much thirst. This I had an opportunity of seeing to an intense degree in one case wherein the nitrate of potash in those doses had been administered several times without any diluent by the oversight of a nurse; she gave it in ℥iss. of plain water. I was on the point of applying numerous leeches to the epigastrium, fearing that gastritis was coming on, when the symptoms at last yielded to diluents and warm external applications, leaving no appreciable effects behind.

I shall now mention what were the *disturbing effects on the system* observed to be produced by large doses of nitrate of potash in cases *where it had been duly taken* with barley-water, but had not been well borne by the system. Those effects were seldom manifested, the medicine, when properly diluted, seeming to act mildly and efficiently. When it is not tolerated, however, its effects are primarily on the nervous system. They are these: general debility of the limbs, especially the lower extremities, and the knees, too, particularly complained of. I have seen this carried to an extent which made the patient believe that they were seized with general paralysis; the whole body seemed to be made of wood, and for some hours it was impossible for them to rise from their seat or to move hand or foot. To this were conjoined general tremblings, and the speech was affected; occasionally the names of things were forgotten or mistaken: there was also giddiness, and a painful rushing sound in the ears. I never in these rare instances saw any distortion of the features, and the symptoms subsided in a few hours by diuretics or copious perspiration. In the event of such results occurring, the chief remedies I should recommend would be hot diluents and hot blankets. The subjects of them will be found gene-

rally of the purely *nervous temperament*, especially if associated with feeble power of the constitution. When the sanguine or bilious temperament is combined with the nervous, the remedy is better borne and may be pushed farther; and it agrees with my observation that the bilious lymphatic temperament, with its firm, harsh, muscular development, is the one in which this plan of treatment the oftenest succeeds and may be used the most fearlessly, as it is the one on which chronic rheumatism, when once established, displays itself with perhaps the greatest relentlessness.

The *concomitant treatment* was simple, and most generally dispensed with altogether (with a view to ascertain more accurately the value of the nitrate of potash itself), except in cases of severe complication, in which the need for additional means, chiefly local was urgent. It consisted in occasional warm baths and vapour baths. Cupping and leeching were had recourse to in such cases as showed a concentration of the disease in particular joints, as evidenced by swelling, redness, and acute pain not shifting its seat. In dull chronic pains localised, occasional blisters were applied, and often with benefit; and, towards the termination of the cases, a liniment of ammonia and turpentine was frequently useful in restoring the natural suppleness of the parts. When the pains were so great as to prevent sleep, and to harass the patient in an unusual manner, a draught of muriate of morphia, with solution of acetate of ammonia and water, was given at bed-time. The bowels were kept free by means of occasional light cathartics; and the treatment was generally commenced by giving a dose of calomel and colocynth, followed by a draught of infusion of senna with sulphate of magnesia.

The *diet* enjoined was nutritious, being the ordinary diet of the house —viz., meat once a day, milk, rice, broth. In such cases as presented symptoms verging on the acute, low diet was prescribed—such as milk, tea, sago, &c. In all old-standing chronic cases generous diet was found the best, accompanied even by ale, porter, wine, or gin.

In the above 100 cases the *duration of the malady previous to admission* was widely different,—so much so, that no analytic average could be struck with a view to results that would not have a tendency rather to conduce to error than to elucidate truth. I may state in general terms that the length of time in these cases previous to coming under the above treatment was from seven days to ten years, whilst there were a few who could remember no period of their lives in which they had not been victims, more or less, to the complaint. Two months, five years, six years, six months, one year, were the most common periods cited; and it should be remarked that nearly all the cases were of an unusually severe character, and had been under all manner of practitioners; for many, despairing of a cure otherwise, had committed themselves to the tender mercies of unprincipled quacks, from whose fiery ordeal they had emerged with the conviction that now nothing but a residence in an infirmary with the reputation of our own could avail to benefit them!

Sex.—It is remarkable that, of the whole 143 patients, 17 only were women, the remaining 126 being men. The average age of the women was $35\frac{3}{4}$, that of the men $37\frac{1}{3}$. From this it appears that, in this part

of the country, men are about 8½ times more liable to be affected with chronic rheumatism than women, or for one woman attacked with chronic rheumatism there will be between eight and nine men. This is in all probability owing to the greater exposure of men to cold and wet; for I have found that in all of these cases the exciting cause, when any could be given, was invariably cold and wet, or sudden transitions from a high temperature to the opposite. On referring to MS. notes of M. Louis' clinical lectures on this subject, taken down by me at the time of their delivery at the hospital of La Pitié, in 1835, I find his experiments the same as to the exciting cause—invariably exposure to cold air or draughts (un vent frais).

The difference as to the *frequency of rheumatism* in France and England seems to be very great. Louis says that, out of 100 cases of all sorts treated by him, he only found one of rheumatism; and in the Paris hospitals, during two years, it was rare that rheumatism, whether acute or chronic, ever fell under my observation, That the difference is great among us will appear from the following fact:—On analysing, a good while ago, a number of cases of all sorts, nearly all of them chronic, treated by me in this hospital, embracing a period of five years, and amounting to 959, I found that 86 were cases of chronic rheumatism, being, on an average, one in eleven and a sixth of the whole number. From this I think we may infer that climate exercises an immense difference in this disease; and doubtless the same cause is, in regard to all other diseases, more powerful than we are generally aware of. How else can we explain the entire exemption of some countries from certain maladies? In India and Egypt phthisis is unknown.

I will take the opportunity of stating here, that I believe heart affections to be very uncommon associates with chronic rheumatism; nor do I think that this malady is apt to be *followed* by cardiac disease. In the cases above analysed it was constantly found that such of them as showed heart disease, had been preceded by rheumatic fever, and the heart affection could be traced to that period of acute disease. This is in conformity with the opinion now, I believe, generally entertained—viz., that acute rheumatism is frequently accompanied by endocarditis, and, without very rigorous measures, is apt to be succeeded by permanent disorganisation of the heart. I have seen this hold to the full extent admitted by Dr. Hope, though not perhaps to the degree maintained by Bouillaud. In chronic rheumatism properly so called, heart disease is, in my opinion, a rare occurrence.

In speaking of acute rheumatism I would record here my experience that in patients *under the age of puberty* acute rheumatism seldom or never happens without most seriously involving the heart; and the younger the patient (I have known it occur at five years) the more certainly fatal is this heart affection. I have never seen a single subject in the above category who eventually shook off the heart affection and recovered. And, in addition to the ventricular hypertrophy and dilatation constantly present in these cases, as well as the valvular disease, I must mention a morbid appearance perhaps equally constant, and which I think has been overlooked by pathologists, or only casually if at all mentioned—viz., a tough, dense, false membrane lining the general interior

of one or other of the dilated auricles, generally the left, obliterating the musculi pectinati almost entirely, and so converting the auricle into an uncontractile sac: thus furthering mitral regurgitation, and, by its undoubted effect of congesting the lungs and brain according to the auricle affected, mainly producing the frightful dyspnœa and brain symptoms which constitute the worst features of the malady.

Of what value is the nitrate of potash in large doses in *acute rheumatism!* I have had no experience of it myself in *acute* rheumatism, trusting as I have done to calomel, opium, Dover's powder, antimony, and, in the worst cases, bleeding; but my friend Dr. Fenwick, of North Shields, who afforded me valuable assistance in preparing the first series of the above cases, when clinical clerk in this house some years ago, as did also Mr. Gibb, informs me that he has adopted it to a large extent in private practice in Shields, and has found it to answer in a remarkable manner. I would also refer you to Dr. Basham's cases of the acute form, and his treatment by the nitrate of potash in large doses—a paper read to the Royal Medical and Chirurgical Society of London, and published in the 'Medical Gazette,' Nov. 24, 1848. His success was great, the urine acquiring a high specific gravity, and the salt being detected in it. The specific gravity was raised to 1030 and 1040, which he thinks was owing to the nitrate, though Dr. C. B. Williams attributes it to the urea and the lithates which are by its agency made to be present in the urine. Dr. Basham states his belief that, owing to its agency in acute rheumatism, there is a certain degree of *exemption* from disease of the heart.

I will conclude this paper (already too long) by recording certain facts and deductions which have manifested themselves to me from the careful investigation I made of the above cases.

In nine cases out of those wherein no relief or only slight relief was obtained, there were either *purulent collections* somewhere, or the usual *common inflammations* which precede suppuration—such as testitis, obstinate conjunctivitis, erysipelas. Are we entitled to deduce from this the general therapeutic principle, that in chronic rheumatism, when it is in that aggravated form in which we have pus circulating in the blood, the treatment by nitrate of potash is not to be depended on, and must be relinquished for another?

Again, in 81 out of the 100, the cure was almost or altogether effected in 14 days by the nitrate of potash in large doses, and these were cases wherein, though severe, there was no suppuration, nor ordinary inflammation of particular organs. It has been before laid down that nitrate of potash acts primarily on the nervous system. May we not infer, then, that those 81 cases were cases in which the nervous system was alone at fault? And, from the two considerations taken together, may we not look at rheumatism as a disease composed of two varieties—viz., that in which its assaults are expended on the nervous system alone, and that other more severe one in which pus circulates in the blood? Various observations and reflections have led me to take this view of the subject. Rheumatism is first a nervous and then a blood disease, and it maintains a distinct individuality in both these phases in a manner more singular than other complaints. In what I call its nervous form it is a

kind of Harlequin inflammation, and less mischievous than it seems. A little energy will knock it out of the system: if uncontrolled, it undergoes a transmutation, becomes grave, enters the blood, and changes it, and walks into the heart itself, the citadel of life. At present we want a set of careful microscopic experiments on the blood in all the varied conditions of rheumatism. Last year, at my request, Mr. Gibb took for microscopic examination small portions of the blood of several patients affected with different diseases. In the blood of one who had no trace of inflammatory disease of any kind we found, to our surprise, numbers of pus globules. In a few days there was developed in this patient a severe erysipelas, which finished by becoming phlegmonous. Here, then, inflammatory disease existed in the blood for a certain time without betraying its presence, until at length its increase became such *(vires acquirit eundo)* that nothing but an acute attack upon the skin sufficed for its elimination.

3. In cases wherein *mercury* has been previously extensively taken, and cases where there is syphilitic malady present in the system, whether mercury has been taken or not, the nitrate of potash is without power. The remedy is the *hydriodate* of potash.

4. In cases of general chronic rheumatism, in which *sciatica* is the most painful feature, the nitrate of potash will banish the complaint from the other parts, but will not avail against the sciatica. In this event, *arsenic*, where it is borne, is the most powerful remedy.

5. In cases wherein the symptoms are doubtful, being circumscribed though severe, and simulating such other common inflammations as pleuritis, peritonitis, ordinary cerebral or spinal meningitis, and even spinal irritation and hysteria, the *state of the tongue* if it appear as if overlaid with a coat of deep or light white paint, so constant in the rheumatic condition, will most essentially guide the diagnosis.—*Med. Gazette, Oct.* 10, 1851, *p.* 639.

DISEASES OF THE NERVOUS SYSTEM.

14.—ON FATTY DEGENERATION IN ITS RELATION BOTH TO SOFTENING OF THE BRAIN AND APOPLEXY.

By William Frederick Barlow, Esq., Resident Medical Officer of the Westminster Hospital.

[Fatty degeneration of the arteries is one of the most important points to be noticed in relation to ramollissement of the brain.]

Amongst the facts which might be adduced to show that obstruction of the larger vessels can give rise to ramollissement, two cases, observed and recorded by Mr. Vincent, wherein that affection succeeded to the tying of the carotid artery, may be well mentioned. The frequent concurrence of degeneration of arteries and apoplectic effusion has long been known. It is remarked by Mr. Gulliver that, "in a man who died of

this disease, the coats of the arteries of the brain, even of the smallest branches, were studded with and made fragile by fatty patches." Professor Rokitansky, whose observations rest upon immense experience, alludes especially to fatty degeneration of the middle coats of arteries in cases of this affection, and says of the well known changes of those vessels : —" Hence it may be inferred that the more minute arteries, and even the capillaries within the brain, are in a similar condition; especially as the former are sometimes found ossified, and the brain filled as if with silver wires." But microscopical research was wanting to place the state of the minute vessels beyond dispute; and I must refer to the observations of Mr. Paget, who not long since published an important paper ' On Fatty Degeneration of the Small Blood-vessels of of the Brain, and its relation to Apoplexy.' " It cannot (he observes) but be that this affection should constitute a predisposition to apoplexy, whether occurring in its simplest form or in connection with cerebral softening." Rokitansky, speaking of disease of the vessels (and assuming, as I suppose, the implication of the minute ones), observes:—" Such a state of the coats appears to some extent necessary as a cause of apoplexy; for it is often observed that the deepest congestions, whatever their nature, but especially those intense mechanical ones which give rise to cyanosis, do not produce apoplexy." It is, doubtless, in those cases wherein fatty degeneration of the smaller vessels of the brain exists that the impeded return of blood from the organ, so much insisted on by Dr. Marshall Hall, is peculiarly dangerous. And it would be of much moment to know whether some of those cases of epilepsy which pass into, and end mortally by, apoplexy, are not thus fatal because of the small cerebral channels being so diseased as not to be able to resist that distension which the convulsion brings. Let it be always remembered that, whatever may be the bad effects of degeneration of the easily discernible vessels, it is as nothing compared with that of the minute ones: from hence escape those disastrous effusions which either paralyse or strike with apoplexy. That fatty degeneration which is here referred to means, not a simple *addition* of fat merely, but implies the damage or destruction of the tissues proper to the affected vessels. No longer are they safe channels for the blood to course through; their condition is such that hæmorrhage may surprise at any moment, or softening insidiously begin. But let us turn to Mr. Paget's clear description of it:— " When the fatty degeneration has made much progress, changes in the structure, and, not rarely, changes in the shape also of the affected vessels may be observed. The chief change of structure appears to consist in a gradual wasting of the more developed proper structures of the vessels. Growing fainter in apparently the same proportion as the disease makes progress, the various nulcei or fibres are at length altogether lost, and blood-vessels of even 1-150th of an inch in diameter appear like tubes of homogeneous pellucid membrane, thick-set with the fatty particles. The structures of the vessels are not merely obscured by the abnormal deposits : they waste and totally disappear."

What is the state of the minute vessels in cases of capillary apoplexy wherein patches of hemorrhage are numerously interspersed throughout the softened tissue ? Fatty degeneration of the minute vessels would,

in all probability, be found in many of them, and especially in the immediate neighbourhood of the effusions. Dr. Hughes Bennett, in his 'Pathological and Histogical Researches on Inflammation of the Nervous Centres,' speaks repeatedly of exudation-granules coating the vessels of the soft portions of the brain; but Mr. Paget has remarked that Dr. Bennett's "attention being directed primarily to the changes of the structure of the brain itself, and to the products of inflammation in it, he appears to have less minutely examined the state of the blood-vessels in the diseased parts. Some of the appearances produced by fatty degeneration are represented by him (in the Edinburgh Medical and Surgical Journal, vol. lviii. pl. v. fig. 56, and very accurately in vol. lix. pl. i. fig. 5); but he refers them to the vessels becoming coated externally with exudation-granules, the products of inflammation." I need not say what a point of magnitude is started here in reference to a theory of causes of the ramollissement. A very elaborate writer on this affection, M. Durand-Fardel (as cited by Dr. Hughes Bennett) has gone the extent of saying that "softening connected with sanguineous infiltration, is a proof of inflammation." But the observations of Mr. Paget, to go no farther, would imply this statement to be erroneous.

Rokitansky says that "there is no single cause that will account for the frequent repetition of attacks of apoplexy in many individuals, and its simultaneous appearance at several different spots in the brain, but the presence of disease of the vessels. This also partially explains its happening symmetrically* in corresponding portions of the brain at the same or nearly the same period."

But now I come to a point which touches the diagnosis of cerebral affections. A knowledge of the *constitutional tendency* is, it is superfluous to state, of the highest consequence in the investigation of disease. We judge often of what a particular part of the body may be doing, by what the whole body seems disposed to do; much, as in the moral world, we interpret an *act* by what we know of the *character*. Now, in the study of diseases of the brain, the pathological tendency often demands the closest inquiry, as the tuberculous affections of that organ well show. Obscure head-symptoms occasionally come before our notice, which may portend nothing of moment, or threaten apoplexy. If apoplexy shall be proved, as I doubt not it will be, an extremely common consequence of fatty degeneration, any clue to the probable progression of the latter in the cerebral vessels will be plainly of value. And may we not find it in the *arcus senilis*, which Mr. Canton has proved to be one form of such degeneration, and often associated with other kinds of it? In several cases of apoplectic effusion, which I have lately met with, the arcus senilis has been very palpable; and, so far as my observation at present leads me, I should, in certain cases wherein it seems doubtful whether apoplexy be foreshadowed or not, lay considerable stress on the presence or absence of this arc, and the rather if a fatty heart were suspected with reason, or signs of degeneration of the kidneys were evident. I believe, too, that the arcus will be found, to

* Probably the most unvarying form of symmetrical degeneration is that instanced by the arcus senilis.

some extent, diagnostic of ramollissement, essecially of that form of it which slowly progresses, and, without any well-marked symptoms of inflammation. Whether it be so or not demands inquiry at any rate.

The arcus has already been found of utility in the investigation of heart-disease; and this makes it the more reasonable to believe that it will be of service in exploring affections of the brain.

Mr. Canton found, very early in his inquiry, that the arcus senilis, and fatty degeneration of the heart, existed together, and so frequently as to show that the one might be a clue to the presence of the other.* Dr. Williams and Dr. Quain have both tried the arc of the cornea as a diagnostic sign, and bear strong testimony to its use in the investigation of heart affections. That use will, *cæteris paribus*, he found the greatest where it appears considerable before its time; but its amount has yet to be determined by inquiry. Sometimes the arc is seen so soon, that it may be properly termed an arcus *juvenilis*,—an expression which has been already used.†

A great part of the interest connected with the whole subject of fatty degeneration lies in its universality, just as its danger consists in its liability to damage, perhaps prematurely, parts necessary to life. See, too, how many phenomena, and what varying consequences, it may produce! Now it encircles the cornea, now stops the heart, now leads to apoplexy, and now (may we not surely say?) to softening of the brain. Mark, moreover, its extreme commonness. Is it not better well to study it than some morbid affection of rare occurrence and strange anatomy? Its relation to many obscure diseases of the nervous system will be found great, I doubt not; and we cannot but believe this, seeing that there is no organ, no part which it affects, that it does not influence *very* commonly. Nor will it be the key only to infirmities of body, but to weaknesses and aberrations of the mind. By involving opposite parts at once, it makes imminent more than one kind of dissolution. It may *simultaneously* impair the irritability of the heart, and damage severely the minute blood-channels of the brain; and could a pathologist bring before his eyes the exact condition of the two organs, he would perhaps be enabled to say which would be the more likely to destroy,—the sudden

* "I have in no instance found this senile arc, when well developed, unaccompanied by fatty degeneration of the heart"—'Lancet,' May 11th, 1850. Dr. Latham, in his lectures on Diseases of the Heart, vol. ii. p. 166, points out the difficulty of diagnosing a fatty change of the organ, and insists on the importance of attending to the "constitutional peculiarity;" it is as an indication of this that the arcus will be proved of value, in *helping* us to be "able during life to conjecture a fat heart with such strength of probability that we almost know it." See Dr. Ormerod's Observations on Fatty Degenerations of the Heart, for some remarks in reference to its diagnosis and history, 'Medical Gazette,' 1849.

† By Mr. Wilde. Mr. Lawrence has noticed the arc (instead whereof a most complete *circle* often happens) at thirty-three years of age; Mr White Cooper at twenty-eight. Mr. Canton has seen it beginning at sixteen (See Part ii. of Mr. Canton's Observations). Dr. Quain tells me that he has observed it well marked at seventeen. Mr. Gulliver says of fatty degeneration of the arteries—"though most common in old age, it was twice seen in subjects not past twenty-one, and once in a boy of sixteen." It would be of great interest to examine the small vessels of the brain in cases of *early* apoplexy. Its most usual time of occurrence has been treated of by Dr. Quain, who has analysed a large number of cases in his "Observations on Cerebral Apoplexy, at different periods of life."

arrestation of the heart's action or the apoplectic seizure. All its effects upon the muscular system alone have not been traced as yet. May it not damage the *intestinal* contractility, and so lead to one form of obstinate constipation, and one more especially prevalent in old age?

In speaking of fatty degeneration, I have, of course, borne in mind the wide difference between the deposition of fat on a part or about it, and that serious change which necessarily implies both damaged structure and impaired action. In Dr. Quain's representations, hardly less full of instruction than their originals, this difference is admirably drawn. The pathological consequences of that fatty deposit which takes place at the "expense and detriment" of the heart's substance is seen at a glance, for fat is not irritable like muscular fibre, nor will it, like it, respond to stimuli and propel the blood. "The heart is a muscle," as Dr. Latham phrases it, "and its functions flow from its attributes as a muscle;" and this may be advantageously remembered by any one who is at a loss to discover why so much stir, as he may term it, should be made respecting the conversion of its fibres into fat.—*Med. Gazette, July* 11, 1851, *p.* 55.

15.—PERIOSTEAL DISEASE AFFECTING THE DURA MATER.

By Dr. R. H. Goolden, Oxon, Assistant Physician to St. Thomas's Hospital.

1. The dura mater is supposed to be very little liable to disease, except as the result of injury, or in connexion with strumous softening of the petrous portion of the temporal bone, or with abscesses about the ear, or as the effect of the syphilitic poison; and this posion, supported by some of our best authorities, seems to have diverted attention from a very common affection of this membrane, of the same character as the periostitis which give rise to nodes on the tibia or cranial bones.

This partial affection of the dura mater, to which I wish to call the attention of the profession, may or may not coexist with general periosteal disease. It is part of the same morbid state, and it has no necessary connexion either with syphilis or with mercury, though these poisons, and especially the latter, greatly favour to its development. Indeed the worst cases that I have an opportunity of observing have been those who, in the tropics, have taken large quantities of mercury for fevers or hepatic disease, often many years previously, and have been afterwards exposed to cold and damp in our more northern latitudes.

2. When I held office at the hospital-ship *Dreadnought*, these cases were both very severe and very common, and I have no doubt continue to be so. They give way, at least for the time, to very simple treatment—viz., iodide of potassa, with sarsaparilla, blisters or issues to the head, and full doses of opium every night, with a good nutritious diet—in the same way as periosteal nodes are known to do. When the pericranium is the seat of the disease, it is at once recognised by the presence of great tenderness, as well as unevenness to the touch; but when the dura mater is affected, this morbid condition is not so palpable; it

is, however, evinced by unmistakable symptoms. The patients are often free from pain during the day, but at eight or nine o'clock at night the pain sets in, and is so agonizing that they are willing to submit to any measure for relief. It lasts till three or four o'clock in the morning, followed by a profuse perspiration, when the patient gets some sleep. The intermittent character, and the time and duration of the paroxysms are very remarkable. For some time the cerebral functions are not impaired, but at length the sufferer complains of a constant headache, though not so severe as during the paroxysm; he holds his head forward, with his brows knit; then follow occasionally epileptic fits, weakness of the lower limbs, paralysis, and the patient becomes greatly emaciated, despondent, and suffers colliquative perspirations.

3. Some years ago, a sailor, who had frequently been a patient in the *Dreadnought* for such attacks as I have described, was accidentally killed by falling between two ships in the river. This afforded Mr. Busk, my colleague, an opportunity of examining the head, when it was found that the inner table of the skull was greatly thickened, and also the dura mater.

4. Such is the most marked and aggravated form of the disease occurring in patients debilitated by climate, mercury, purpura, or syphilis, which no one would fail to recognise as identical (except in situation) with periosteal disease, when it attacks the tibia, ulna, cranial bones, crest of the ilium, &c., in the form of nodes, and for which the iodide of potassium seems to be the appropriate, if not specific remedy.

5. Although this aggravated form of periosteal disease of the dura mater is most common in sea-port hospitals, where the patients have been for the most part exposed to *all* the predisposing causes, yet observation has convinced me that it occurs also in a milder form, and therefore more likely to escape recognition, as the cause of many distressing headaches, ultimately leading to epilepsy or paralysis, or at all events reducing the sufferer to the most distressing state of debility; and patients so suffering apply to us for relief in our daily practice, both in hospitals and in private life. Such cases I have met with, both as out and in-patients of St. Thomas's Hospital, as servants in the employment of the Great Western Railway, and in private practice.

6. These cases are marked by headache, having its regular nightly paroxysms, morning perspirations, and gradual emaciation. The patients have mostly been treated for dyspepsia, rheumatism, gout, neuralgia, brow ague, and often for phthisis. I have several times been called upon to examine such patients' chests, as they were supposed to be obscure cases of phthisis, having, in addition to the above symptoms, some cough and bronchial murmurs; but by the peculiar expression of countenance, the pain and wakefulness during the first part of the night, the true nature of the disorder has been recognised.

7. A blister to the head, opium at night, and iodide of potassium and sarsaparilla during the day, have dissipated all the symptoms, and the patients have returned to their usual occupations.

8. It is interesting to know what becomes of these patients. The great drawback to the results of our hospital practice is, that we cannot infer that a patient is permanently cured, because we do not see him

again. On the Great Western Railway I have had an opportunity of watching the results. I have found that some have had no recurrence of the attack; others are subject to relapses after various intervals, but are always relieved by the same remedies; others are attacked by periostitis in its more generally recognised form; others are relieved only so long as they continue to take the iodide of potassium.

9. The connexion of this disease with epilepsy is often more intimate than is generally supposed. Without pretending that it is an universal cause, as we know that intestinal irritation and direct injury to the bones will produce epilepsy, it is as well, in obscure cases, to bear in mind that this is a possible cause, and one capable of being to a considerable extent, if not entirely, removed.

Having endeavoured to show that periosteal disease of the dura mater is a frequent cause of a very severe form of headache, and leads occasionally to serious consequences, such as epilepsy and paralysis, I now purpose to offer the results of a more general induction from cases of *periosteal disease*. In adopting the name periosteal disease, I must disclaim any intention of asserting a theory as to the seat or nature of the disease itself. I have rejected the usual term *periostitis*, because I do not consider that there is any ground for concluding that the periosteum is more than secondarily affected, and certainly it is not always inflamed; and with every reluctance to change names, from the confusion necessarily attendant on such changes, I think we cannot too soon abandon those which are theoretical and involving doubtful theories. Without venturing to assert positively that the disease in question has its seat more properly in the bone than in the membrane, I can refer to cases where inflammation and suppuration of bony structure without nodal deposit, have been attended with intermittent pains of great intensity, relieved only by the trephine; and as far as we can form an opinion of pains endured by others, the quality of the pain seems to be very similar, although we have no positive proof of inflammation of bone in nodal disease.

The following laws are the inductions of my own clinical observations.

1. There is a morbid condition of the human body, giving rise to congestion of the periosteum, including the dura mater, with deposits of earthy matter between the membrane and the bone.

2. This morbid condition is properly a specific disease existing in certain constitutions, which may either remain latent or be called into action by external influences.

3. These influences are mercury, purpura, fevers, or any cause which depresses the vital force or germ-life, and especially exposure to cold, damp, and absence of sun-light.

4. Iodide of potassium has a specific influence in arresting the diseased action, but not of curing the morbid diathesis, which is always liable again to become active whenever the vital force is lowered.

5. There are some constitutions which take on this diseased action readily after a very small quantity of any mercurial preparation has been administered. Nor is there any influence so powerful in its production as mercury, (a reason for its having been so often regarded as a symptom of secondary syphilis.)

6. It occurs at all periods of life, in both sexes, and in virgins as well as married women—(this is a simple matter of statistics.) Prostitutes and their male associates being more liable to periosteal disease than others, does not so much indicate a venereal origin, as it indicates the co-operation of many exciting causes, viz.—mercury, night exposure, mental distress, dissipation, and destitution. I can refer to many cases of periosteal nodes in young women whose social position affords the strongest ground of confidence in the absence of a syphilitic taint, as well as in boys before the age of puberty, in which there was every assurance that syphilis had no share in their production. I have now two well-marked cases in Luke's ward, of the respective ages of thirteen and fourteen, and I have pointed them out in private practice, to the satisfaction of able and experienced medical practitioners. Such cases taken separately may not satisfy some of my professional brethren, who believe in the universal depravity of the human race; but when taken altogether, the probability becomes as nearly positive as the inductive process can render it; for it is highly improbable that boys, and even young girls, can suffer from syphilis without applying for relief, and that, of all secondary symptoms, periosteal nodes should so often remain as the only trace of syphilitic taint. It is argued that the parent's sins are visited upon the children; but surely such an assertion is merely conjectural, and requires more proof than is offered; though we may readily admit the influence of syphilis in parents in developing hereditary disease in the offspring, by its lowering the power of the germ-life.

7. The disease, in its state of activity, is indicated by local pain and wakefulness, commencing for the most part from eight to ten o'clock every evening; towards morning the pain abates, and is succeeded by perspiration; and it is attended with gradual emaciation. The period of the commencement of the paroxysm is remarkable, and a good index of the nature of the complaint, but I have cases recorded where patients have been awakened from their sleep by the paroxysm at a much later time, and I have two well-marked cases where it commenced between eight and nine in the morning; one of these is now under treatment. She lives at Woolwich, and had been treated for brow ague; quinine, steel, and emetics, as well as aconite as an external application, had been tried without relief, ague prevailing greatly in that locality. Profiting by the failure of former treatment, which I might otherwise have adopted myself, I gave the iodide of potassium, with some mistrust in the result; but the very marked relief, after seven months of constant suffering, has confirmed my diagnosis. The exceptions are sufficiently numerous to prove that the exact time of the accession of the paroxysm is an accident, rather than a property, of periosteal disease, though sufficiently frequent to be of great practical value, and therefore I say, "commencing *for the most part*, from eight till ten o'clock every evening."

8. The locality of its development is very uncertain, but may be, wherever the periosteal membrane extends, whether over bone or cartilage, dependent upon some variable predisposing causes. The most frequent localities are the cuticular surface of the tibia, of the ulna, the cranial bones, the sternum, clavicle, ribs and cartilages, the crest of the

ilium, but very frequently in other less obvious situations. To these I shall refer presently.

9. During the paroxysm, the periosteum is greatly congested, and very sensitive, a deposit of bony matter taking place at each paroxysm.

Before the experiments of Dr. Robert Williams upon the use of iodide of potassium in St. Thomas's Hospital were generally known, it was common in very severe cases to cut down upon the periosteum, and to divide it. When a dresser at St. Bartholomew's, I remember to have seen several instances in which this was done, and, as I was then taught, for the purpose of relieving the tension caused by the node. The bright crimson colour of the membrane was remarkable, and this colour was considered a proof of its inflammatory state. However, I believe it is now admitted that the remission of the paroxysm is an evidence that the pain is not dependent upon tension, which would be a constant cause; and that the congestion of membrane is a normal state under some circumstances, as in young bone during its development from cartilage, and about injuries where reparation is necessarily attended with the deposit of new bony matter. Moreover, the membrane itself is often relaxed as well as thickened over the node. Also, I must observe that the nodal deposit is usually softer, and contains less earthy matter, than the bone itself. With a tolerably sharp penknife it may be often cut off from the bone, the hardness of the bone protecting it from being injured by the knife; but the degree of hardness varies according to the nature of the bone, the age of the patient, and the duration of the node. There is reason to believe that when inflammation occurs, suppuration is the consequence, and then a separation of the membrane. This occurs occasionally, and I have observed it several times at the lower end of the femur and at the carpal end of the radius, requiring the pus to be let out; but I cannot find that I have met with it in other situations, nor do I remember to have done so; and it is very remarkable how very seldom, comparatively, suppuration takes place.

I shall conclude with a few words upon the diagnosis. The ordinary nodes are too obvious to need any remark; it is only when the disease is less palpable that there is any room for mistake, and I shall refer to a few such instances.

The upper end of the humerus and the lower end of the femur are very common seats of its development, and often overlooked. The shoulder is aching, tender, cannot be moved on account of pain; there is no perceptible swelling, (the swelling occurring under the covering of the deltoid and the biceps, near the joint;) the muscles are extenuated for want of use; the pain is more severe in the night; there is no effusion in the joint, and the patient keeps the shoulder elevated; the muscles being inserted into the periosteum, we can easily account for the pain on moving the joint. The pain occurs at first in nightly paroxysms only, but there soon follows a state of permanent congestion or subacute inflammation, which I believe rarely extends to the joint, though in two cases, after all pain even on movement had subsided, the movement of the joint was limited by adhesions. Such results are very rare indeed. The hip joint is liable to a similar affection, but it is not so common. These cases are particularly amenable to remedies.

The iodide of potassa is given three times a day; and when of any long standing, blisters or issues are necessary to relieve the chronic inflammation, which I believe to be the result, rather than the essence, of the proper diseased action. I very much prefer the nitric-acid issue; it is applied by dipping a piece of lint, the size of the issue required, into strong nitric acid, and applying it, not too wet, to the tender part; it is best to place it anterior to the joint; then it should be covered over with a piece of lint, saturated with carbonate of soda, which will prevent its spreading beyond the desired extent; the pain so produced is considerably less, and of shorter duration, than that produced by caustic potassa, and it is less formidable than the moxa. It is then covered with a linseed poultice, or cotton-wool, moistened, and covered with oil-silk. The slough usually comes away in five or seven days, and the discharge will continue till the pain is quite removed; but it must be borne in mind that blisters will give no permanent relief, unless the iodide of potassa is given internally,

I must also refer to some painful swellings of the tarsal and metatarsal, as well as carpal and metacarpal, bones, often observed to remain after attacks of gout, when all active signs of gout have subsided,—and I believe sometimes mistaken for gout,—and to the known success of the iodide of potassa in relieving the pain. These swellings of the fingers and wrists are very different from chalk-stone deposits, though they disfigure the hands. They are very common in advanced life, and then they rarely subside so as entirely to restore symmetry of form. But the same observation holds good in all other forms of periosteal deposit; that is to say, although the activity of the disease may be arrested by iodide of potassa and blisters, the absorption of earthy matter in old age is much more difficult; the pain will subsde, but the tibia and frontal bone still retain the swelling and unevenness.

Another set of periosteal deposits is on the fangs of the teeth, causing the most agonizing toothache, without any apparent decay of the teeth. The fang of the tooth becomes thickened, too large for the alveolar cell, and, when drawn, the membrane shows unusual vascularity, and there is a deposit of dentine, softer than the fang of the tooth, and may be cut with a penknife, (as I mentioned in the case of nodes), between the membrane and the fang, giving it bulbous form, and rendering it difficult to be extracted without breaking. This is not uncommon after mercurial salivation; but it is observed sometimes where mercury has not been given; and I am told by Mr. Stokes, of Lower Brook-street, who shewed me many specimens of such teeth, that he has observed them in ladies who have taken metallic remedies for a continuance—especially salts of iron. But it is a question for still further enquiry, whether those patients had not been suffering under periosteal disease, and that steel had been given for the relief of headache, and remittent pains about the chest and other parts—sometimes for neuralgia—all dependent upon this state of the system.—*Lancet, May* 16, *p.* 149, *and August* 23, 1851, *p.* 174.

16.—ON THE TREATMENT OF CONVULSIVE DISEASES.

By Charles Bland Radcliffe, M.B.

[Dr. Radcliffe first alludes to the hygienic measures to be adopted, and he says, in considering the treatment of convulsive affections, we should first endeavour to secure a pure atmosphere and a free exposure to the sun. Then with regard to the diet; is it to be generous or frugal? After discussing this question at some length, Dr. Radcliffe determines decidedly in favour of the former. Next, as to the expediency or inexpediency of stimulants? He says it is well known a glass of wine is an excellent remedy for the shivering occasioned by cold, and that is almost equally efficacious in the tremulousness of old age, and that it is very likely to afford relief in a paroxysm of chorea. It appears also he says that the dram drinking of the lower classes (when restrained within the bounds of moderation) is of use in counteracting the pestiferous atmosphere of close and ill ventilated habitations. He also instances its value in subsultus, in cases of fever, in delirium tremens, in tetanus, and hydrophobia; though rather of a negative character in these cases. In the convulsive affections induced by certain mineral poisons, in those cases of agitation of the heart and body generally, which refer to exhaustion, and particularly to hemorrhage. In hysteria it is well marked, and even in epilepsy Dr. Radcliffe says that no unequivocal benefit has been shown to arise from the treatment where stimulants have been withheld. Lastly, is active exercise admissible or not? In answer to this question the author states that any exercise bordering upon fatigue is to be avoided, for until the muscles have received their tone so as to be able to resist involuntary contraction, it is natural to conclude we should not carelessly throw away what strength they have in voluntary efforts.]

The medicinal treatment of convulsive affections involves the consideration of many debateable points, and it is very difficult to arrive at the possession of any fixed and constant principle of action; indeed, it is only possible to do this by a careful and separate examination of the nature and effects of the chief forms of remedial agents. And to this, therefore, we will endeavour to apply ourselves.

1. Our first inquiry shall be into the merits of the measure which occupies the head of the list, namely, *bloodletting*. Now, in doing this, it may be said, without any fear of contradiction, that bleeding would never be thought of as likely to relieve the tremulousness of delicate or aged persons. Experience has also decided against this remedy as a means of cutting short the initial rigours of ague or fever, or the cramps of cholera,—in which latter case, indeed, it rarely happens that the blood will flow if a vein be opened; and whatever doubt there may be at the onset, vanishes towards the sequel; for no one could be mad enough to resort to it for the relief of subsultus. Again, there is no imaginable benefit to be expected in the agitation or epileptoid convulsions consequent upon hemorrhage. And, in catalepsy, there would scarcely seem to be any more likelihood of good resulting from it than in the rigidity of actual death.

Bloodletting is manifestly improper in the greater number of choraic or hysterical subjects. At times, indeed, the circulatory powers may be somewhat active, and the symptoms those of excitement rather than of convulsion; but it does not follow that, because bloodletting may be then expedient, (which is by no means certain,) that it is so in the convulsive forms of the malady. There are cases of epilepsy, also, in which all are agreed that no blood can be spared with impunity, but in the majority an opposite opinion is entertained. It would appear, however, that the practice has greatly changed of late years, and is still in process of change, and that the lancet is now resorted to with far more hesitation than formerly. Attention, indeed, would seem to have been drawn to the fact that an attack is very apt to follow accidental or intentional hemorrhage, and that a like result is the invariable attendant upon death in the shambles; and, on the other hand, faith seems to have been shaken as to the benefits resulting, even when the depletion has been very carefully guarded. Cases illustrating the first doubt are related in great numbers in medical writings, and are of continual occurrence in every-day practice. A few months ago, for example, I was called to a youth residing in Paddington, who had been under my care for some time, and who had almost recovered from a liability to frequent and severe epilepsy. He had had a violent fit, and this had followed immediately upon a very free hemorrhage from a wound which he had inflicted in his hand with a chisel. Since this accident the fits have been as frequent as they were before, and the loss of blood is the only cause to which I can assign the relapse. In another case of epilepsy occurring in the same neighbourhood, which had been relieved in like manner by a generous plan of treatment, and in which the fits had been absent for nearly two years, a relapse took place during a visit to the country, within a few hours after a free bleeding, which had been thought advisable to relieve some acute and accidental mischief. Another objection to this mode of treatment is also to be found in the fact, that convulsions are most violent where the system is most emptied of blood and most debilitated in other respects, and that coma, and not convulsion, is the most characteristic phenomenon in sanguineous habits; and hence he should argue, that any measure which would lessen the vascular fulness would be likely, *ceteris paribus*, to increase the liability to the epileptic seizure. We do not object to blood-letting, therefore, merely because convulsion is the consequence of excessive hemorrhage, but on this ground also, namely, that the severity of the attack would seem to be in proportion to the impoverished character of the blood and the emptiness of the vessels.

Many, however, will agree in discountenancing the use of the lancet, and yet at the same time contend that local bleeding is attended with great advantages. It seems to me, however, that the arguments against the one are equally against the other, and that to reason differently savours somewhat of the times anterior to the discovery of the circulation. Moreover, it not unfrequently happens that the advocates of this practice find it necessary to associate it with tonics; and this itself is a great objection, for if the one be necessary (if we reason upon ordinary rules) the other is unnecessary, and not only so, but injurious. Nor

can it be urged that local depletion is needed for the relief of congestion; for, supposing such a state to exist, it has been shown to be not the cause of the disease; and even granting this, it may be objected that the mere taking away blood, by increasing the general debility of which the congestion is symptomatic, would be more likely to aggravate than relieve the evil.

It would appear, therefore, that there is a great mass of direct evidence against bleeding in these affections, and, on the other hand, we can find no proof that certain benefit has resulted from the practice. Indeed, as we shall see in the sequel, the voice of experience is in favour of a contrary plan.

2. The true value of *purgatives* in the treatment of convulsive affections may be ascertained by considering their effect in varied as well as in particular circumstances. In the first place, then, we find no difficulty in deciding upon the question of fitness in persons where the convulsive symptoms assume the form of tremulousness, whether this be in early life or advanced age. Here we find them occasionally necessary to correct a loaded state of the bowels, but beyond this they are not wanted; and this is as we might expect, for the muscular agitation does not depend upon the irritation of any acrid matter lodged in the digestive canal, or upon any plethoric fulness of the vascular system, which might be relieved by a free and copious action of the bowels, but simply upon general delicacy or decline. In chorea and hysteria much good is done by a judicious use of aperients, in the relief of the obstinate constipation which is so frequent and troublesome a symptom; but we find that the articles selected by experience as best fitted for securing this end are endowed with stimulant and tonic properties. Indeed a most successful plan is to associate some remedy which is a tonic-bitter as well as aperient, as aloes or rhubarb, with some decided tonic. The bowels, in fact, resume their action most readily under means which impart tone to the system generally; and unless this end be secured, anything which merely hastens excretion, will be likely to do harm rather than good, and lead to greater torpidity. Hence, we should argue, that purgatives, as purgatives, are not called for under ordinary circumstances in the treatment of chorea and convulsive hysteria. Again: the history of the shivering, starting, and spasmodic movements, associated with fever, are of like significance. In initial rigors the system presents evident and unmistakable signs o depression, and we should argue, therefore, as to the inexpediency of remedies which themselves are directly calculated to aggravate this state. In cholera, indeed, it would seem as if the consequence of such a practice were shewn to us experimentally, for here we find that the severity of the cramp is in proportion to the purging. It is often found, also, that the subsultus of the latter stages of fever is in great measure due to the exhaustion consequent upon diarrhœa. So that from all points of view alike, the evidence is unfavourable to the use of purgatives in these particular cases. Again: it is found that the movements in the bowels occasioned by these remedies are very apt to intensify the spasms of tetanus. This result is attributed to irritation; but it is equally, if not more reasonable (considering the premises) to suppose it due to the

depression resulting from the evacuation, as in cholera or colliquative diarrhœa. Nor is any evidence in favour of purgatives to be gathered from the history of catelepsy, or any other state in which the muscular contraction is continuous.

Unless, therefore, there be a loaded state of the bowels, we find as yet no reason for the employment of purgative remedies in the treatment of convulsive maladies. And, this being the case, we have next to enquire into the rule which applies in epilepsy. Here, then, it is not to be denied, that purgatives are given and given largely, and that an exceeding prejudice exists in their favour; but, notwithstanding this, it is difficult to adduce any satisfactory reasons, either theoretical or experimental, for the practice. We cannot recommend them for the removal of plethoric fulness, for this has been shewn to have no existence as a cause of the disease. We cannot recommend them on an account of any certain good which their use has produced, for this there is no evidence. It is well known that benefit has frequently resulted from a combination with tonics, but in this case it is begging the question to ascribe the chief share to the purgatives. It is well known, also, that benefit is almost invariably found in the use of the oil of turpentine; but here, again, the purgative action is quite secondary to the stimulant, at least we may suppose so, for this remedy is much more nearly allied to pure stimulants than to any other class of medicinal agents; and not only so, but the benefit itself, in many instances, is altogether irrespective of any action upon the bowels. Nor does mercury deserve the exception which is so often accorded to it, especially in this country. There are, undoubtedly, innumerable cases in which this drug is of the highest value; but that convulsion is not one of these, may be argued from the known fact, that the convulsive phenomena called mercurial tremblings are actually induced by it, when introduced into the system in poisonous quantities, as is the case in gilders. In fact there is no evidence that any purgative is necessary in epilepsy, any more than in the other convulsive affections, unless to remove some accidental accumulation in the bowels.

[Dr. Radcliffe has previously arrived at the conclusion that the predisposition to convulsion is marked by debility and prostration of the system, and that the convulsion is dependent upon a diminished supply of vital force in and to the muscles. But, he continues,]

It is not sufficient, however, to say that convulsion is connected with debility and prostration, except we can account for the occurrence of this phenomenon in some cases, and the absence in others; and it remains, therefore, that we endeavour to point out the special as well as the general characteristics of this state.

What, then, we may ask, is the ultimate idea at which we can arrive in the investigation of this pathological condition? Is it distinguished by any local affection? That it is not, would appear to be evident in the mere fact, that no one single affection is to be pointed out as a constant and unvarying accompaniment, as well as from other considerations which have been already entertained. Upon this point, indeed, we owe the highest deference to the first physiologist of the age, — but at the same time

we must say, that when Dr. Marshall Hall divides convulsive affections into *centric*, or those which refer to the spinal cord for their origin, and *excentric*, or those which originate elsewhere, he is virtually no longer the advocate for the exclusive claims of that portion of the nervous system with which his name stands connected, and will stand connected so long as physiology is a science. But, be this as it may, we have stated the ground upon which we venture to found our own opinion, and upon this we must stand or fall.

And if there be this absence of any local affection which can give speciality to the convulsive disorder, is there some general characteristic which we have not yet noticed? That there is, and this a satisfactory one, will appear, if we give the subject a little consideration. Thus, we find a remarkable diminution in the contents of the vascular system at the time of the seizure, which diminution would appear to be intimately connected with the subject in hand. Persons apt to tremble in the cold, will find, if they pay proper attention, that the first consequence of the exposure is an abundant secretion of urine, and an almost irresistible necessity to empty the bladder. It is well known also, that a seizure of hysteria or epilepsy is generally ushered in by a similar copious secretion and discharge; and that it is the same in the initial rigours of fevers. Again, women are most prone to hysteria after copious menstruation; and epileptoid convulsions are the direct consequence of excessive hemorrhage. In cholera the urine is suppressed, but in place of this, there is an abundant serous discharge from the bowels; and in the subsultus of the last stages of fever we have most generally a free colliquative diarrhœa. In fact, wherever there is convulsion, we find that the vessels have been emptied to a greater or less degree, either by natural or unnatural secretions, or by direct hemorrhage.

Now, there are certain reasons by which we are led to suppose that this change is intimately connected with muscular contraction. Filling of the vessels of erectile tissue, for example, is as necessary to the state of turgidity, as emptying to the return of the quiescent condition,—in other words, the vessels must be emptied, in order to allow a state of contraction in the irritable fibres of the vascular coats and interstitial spaces. It may be objected, indeed, that this contraction is not that which takes place in muscular structures; but, at the same time, it is to be remembered, that there is a complex vascular web in muscle which differs but little from that which forms the basis of erectile tissue, and which, therefore, may be supposed to be affected in the same way by the removal of the blood, and also that the fibrous parenchyma in each case is allied by so many intermediate gradations, as to be in reality but varieties of the same irritable fabric. The illustration, however, may be admitted, without contending for the analogy, and from it we may understand, in some measure, that a full state of the muscular web of vessels may oppose a mechanical bar to contraction in the parenchymatous fibres, and that emptiness will facilitate, if not induce this state.

Here, then, we may perhaps find *one* reason why convulsion does not always attend debility or prostration. At times, for example, a person liable to hysterical fits, being overcome by the sudden communication of some painful intelligence, may fall down in a state of syncope; whereas, if the

disclosure had been made gradually, the kidneys, or skin, might have acted freely, and (the vessels having been emptied to the requisite extent) convulsion, and not syncope, have been the result. Again, an epileptic may fall down in coma instead of convulsion, and still the reason be that the suddenness and extent of the disturbing impression has not allowed time for the vessels to part with any of their contents.

It does not concern us in this place to inquire into the ultimate cause of the change of which we have been speaking; but it is worthy of remark, in passing, that it may depend upon a contraction in the fibrous elements of the vascular coats, by which the internal capacity of the vessels is rendered insufficient to hold their former contents; the contraction itself being analogous to that which takes place at a later period in the interstitial fibrous textures, and referring to the same causes for its origin. In this way of regarding this phenomenon we gain, moreover, some light as to its probable importance, for the emptying of the vessels, whether through natural channels of secretion or by accidental outlets, may be indicative of contraction—*convulsion* in the fibres of the vascular coats, or in the tunics of the ultimate cells. In fact, it may be an initial phenomenon of the convulsive attack.—*Med. Times, June* 14, 1851, *p.* 646; *and May* 24, 1851, *p.* 560.

17.—*On Muscular Irritability in Cerebral and Spinal Paralysis.*—By Dr. Marshall Hall.—At the meeting of the Academy of Sciences of Paris on the 28th July, 1851, a paper of Dr. Marshall Hall was read: 'On muscular irritability in cerebral and spinal paralysis.' The paper closes with the enunciation of the following facts: 1. There are cases of paralysis where the muscles of the affected limb contract under a less degree of the galvanic influence than those of the sound limb. 2. The contrary takes place in other cases—the muscles of the sound limb are then more sensitive than those of the affected side. 3. In these cases the influence of the brain, or that of the spinal marrow, is respectively intercepted. 4. The removal of the influence of the brain conduces, within certain limits, to a comparative irritability of the muscular fibre; whilst the reverse is obtained when the influence of the spinal marrow is taken off. 5. This difference in the degree of muscular irritability is to be looked upon as a diagnostic sign in cases of cerebral and spinal paralysis. 6. An apparatus which yields a simple and slight current, is alone capable of shewing this difference; and this apparatus, to the exclusion of those which give a current often repeated and of great intensity, is the only one which can be used for the purposes of diagnosis.—*Lancet, Aug.* 16, 1851, *p.* 156.

18.—ON A FUNCTIONAL AFFECTION OF THE SPINE, LIABLE TO BE MISTAKEN FOR ORGANIC DISEASE.

By Henry Kennedy, Esq., A.B., M.R.I.A.

The affection alluded to was essentially a disease of the young, being seen most frequently between twelve and twenty years of age. Dr. Kennedy had, however, met with it as early as nine years, and as late as twenty-five. He had only seen it in private practice, and it was

more common amongst males than females, in the proportion of at least two to one. It consisted in a pain in the back, combined with weakness, and this was always referred to the lumbar region; at least he had never seen it higher up. This pain commenced gradually, and might or might not be attended with the feeling of weakness; and occasionally only the latter was complained of. On examining the spine, the patient was nearly always able to refer the suffering to a particular part; but Dr. Kennedy had seen cases where the feeling was more diffused. It was worthy of notice, that a rough examination of the part might be made—the spine might be twisted, or percussion strongly used, and yet the patient would not complain. When left to their own feelings, they invariably preferred the recumbent posture. Walking was much less irksome than sitting, and particularly when they had no support for the back. In addition to an ordinary chair, they would use a cushion, so that it might press on the spine where they complained; and even when reclining at full length, they often placed a cushion in the hollow of the back, so as to cause direct pressure. Those whose business led them to stand and work at a desk, seemed peculiarly liable to the affection.

Case 1.—Mr. —, a young gentleman of 18, whose employment was in an office in Dublin, where he spent six or seven hours a day, partly standing and partly sitting at a desk, began to suffer from pain in the small of the back. He was of small size, but of a highly developed nervous system, as was shown when he laboured under any common indisposition; as, for instance, a cold. The pain in the back was trifling at first, though constant; so that he was able to pursue his usual avocations for about four months, when it became so distressing that he was compelled to confine himself to a sofa the greater portion of the day, and when he did sit up, he always used a cushion between his back and the chair. On examination, nothing wrong could be detected with the part of the spine of which he complained most; which was about the third lumbar vertebra. It could be twisted, and otherwise roughly handled, without causing any inconvenience, but he could not sit without support beyond a few moments. When he had any inducement, he could go through an amount of exertion on his feet, which seemed totally incompatible with the other symptoms. His general health appeared good; his tongue clean; his appetite not impaired. He continued in this state for four months, during which time he was seen by the late Mr. Carmichael, and a variety of treatment was adopted. In two months more he had recovered so far as to be able to resume his business, and at a still later period, recovered completely; nor had he since, though some years had passed, suffered from the same affection.

Case 2. A brother of the last patient, at the age of 21, began to suffer from pain in the back, attended by a feeling of weakness. He was also in an office where both standing and sitting at a desk was necessary; but it was in a country town. At first it was merely an inconvenience; by degrees, however, it became worse, so that he could scarcely go through his duties, and finally he came to Dublin for advice. He was seen by Mr. Cusack and Dr. Kennedy, and the symptoms were exactly those detailed in the last case, but not so severe. In this instance there were some signs of dyspepsia. After a certain period, not so long as in the former

instance, this patient also got well, and had remained free of any suffering from his back, a period of five years having elapsed.

With regard to the *nature* of this affection, Dr. Kennedy was inclined to say—though it be anything but proved—that it arose from causes incident to the period of life at which it occurred, conjoined with some obscure derangement of the general health. But this was but conjecture.

The *diagnosis* was of some moment; for the symptoms might lead one to dread the existence of serious disease; or it might be confounded with an organic disease. A young lady, while abroad, got the affection. She was advised to keep the recumbent posture, and to have issues put in. This advice was persevered in for some months, when she was brought home, and seen by Sir Philip Crampton, who at once ordered the issues to be dried, and the patient to get up, and go about. This was done and the lady recovered, though slowly; for her general health had been injured by her long confinement. The diagnosis would probably, turn on the presence or absence of constitutional symptoms; such as a quick pulse, night sweats, &c. In addition, even a rough examination of the spine did not cause any pain to the patient—a marked contrast between the two cases; and lastly, the situation afforded some assistance; for in the one affection it was as far as Dr. Kennedy had seen, always in the lumbar region, and sometimes even at one side of the vertebral column; while in the other, organic disease was not probably so common here as higher up.

The *prognosis* is favourable. The patient will get well; but his recovery will occupy some time. Dr. Kennedy had seen no instance where the affection was completely got rid of under six months; and in some of the cases it was much longer. It sometimes returned after the patient had been well for months. To say that no case could run into more serious disease, would be going farther than prudence would justify; for in truth this affection, when well-marked, was sufficiently distressing. But Dr. Kennedy had not met any case of the sort. In one instance, indeed, a patient laboured under it when she was between eleven and twelve years of age. She recovered perfectly, but about two years subsequently was attacked with caries of the cervical vertebræ, which ultimately proved fatal by the disease extending to the membranes of the brain. With this exception—and it was not a case exactly in point—he had known no fatal results in connection with that form of spinal affection under notice.

On the subject of treatment, Dr. Kennedy had nothing very definite to offer. A considerable variety of means had been used, both local and constitutional. The former included local bleedings, dry cupping, blisters, frictions, the cold douche, and galvanism; and the latter, aperients, tonics, change of air, and relaxation from business. Of these two, the latter had in his experience proved by much the most useful. He had also seen benefit follow the application of small and repeated blisters, as also the use of a weak stream of galvanism, applied daily, or every second day, according to circumstances. The patient, too, often got great relief from wearing a stiff belt. Still the general measures were the more important. In all the severer cases, the patient must give up his business for a time; two or three months complete

relaxation must be enjoined, and if the patient could change his air, so much the better. Exercise, more or less, according to circumstances, should be advised to be taken daily; not of course, to be carried to fatigue: at the same time that the patient, while at rest, might with advantage assume the horizontal position, propped up or supported in the way most agreeable to him. Strict confinement would generally do much more harm than good. Besides relaxation from business, and change of air, the cold douche, frictions, &c., were worthy of trial. As to medicines, Dr. Kennedy had tried a number, more particularly those of the tonic class; excepting strychnine, however, from which in some cases benefit had arisen, they appeared to produce little or no effect.—*London Journal of Medicine, Aug.* 1851, *p.* 776.

19.—*Brucine in Paralysis.*—It has been said that brucine is possessed of little efficacy, and is a faithless agent, compared to strychnine. M. Bricheteau's experience leads to a different conclusion, and as it can be given in far larger doses than strychnine, it is a more manageable medicine. Commencing with pills containing two or three centigrammes, he has in some cases, gone as high as 80 c.; but it is rare for such doses to be required. At the dose of from 10 to 15 c. slight jerks and prickings are felt in the limbs, and at from 20 to 25 the jerks are stronger, and are accompanied by rigidity of the limbs, which assume a forced extension when the patient tries to walk. There is no cephalalgia or disorder of the mind produced.—*Med. Times, Aug.* 9, 1851, *p.* 160.

20.—*Variations of the Sulphates and Phosphates excreted in Acute Chorea, Delirium Tremens, and Inflammation of the Brain.*—By Dr. H. Bence Jones.—[Dr. Bence Jones says, that]

Having determined the variations of the sulphates in the state of health, when different diets, amount of exercise, and medicines were taken, the variations of the sulphates in disease were examined. At the same time, the total amount of alkaline and earthy phosphates was determined, partly in order to see whether the amount of sulphates and of phosphates bore any relation to one another, and partly to test the conclusions which were drawn in the author's previous paper 'On the Variations of the Phosphates in Disease.'

The cases were thus classified:—

1st. Acute and chronic diseases, in which the muscular structures were chiefly affected, as chorea.

2d. Functional diseases of the brain, as delirium tremens.

3d. Acute inflammatory diseases of the nervous structures, as inflammation of the brain.

4th. Chronic diseases of the nervous structures.

5th. Acute diseases, in which neither the nervous nor the muscular structures were chiefly affected.

6th. Chronic diseases in which neither the muscular nor the nervous structures were chiefly affected.

The three last classes gave only negative results.

In illustration of the first class, three cases of most intense chorea are detailed. The urine was examined frequently from the third to the eleventh day. The phosphates were found to be diminished; the sulphates were present in very great excess. The urine was found to be so loaded with urea that nitrate of urea crystallised out before the urine was concentrated. The specific gravity of the urine was as high as 1036 in one case, 1035 in another, and in the third 1031.

In illustration of the second class, three cases of delirium tremens are given. The urine was examined from the fifth to the fourteenth day of the disease. The phosphate were not found to be so remarkably diminished as in the cases reported in the previous paper. The sulphates were found to be exceedingly increased. The amount of urea was so great that nitric acid caused an instantaneous crystallization. The specific gravity was, in one case, 1041; in another, 1037; and, in the third, 1027.

In other words, there was the most remarkable correspondence between the state of the urine in acute chorea, and in delirium tremens.

In illustration of the third class, four cases of acute inflammation of the brain are given. The urine was examined from the fourth to the twenty-sixth day. Though the inflammation in these cases was not of so intense a kind as in those which were recorded in the author's previous paper referred to, yet they confirm the statement that in inflammation of the brain the phosphates in the urine are increased; they also lead to the conclusion that the sulphates are at the same time increased in the same degree.

In conclusion, the author states the phenomenon common to acute chorea, and to intense delirium tremens, is increased and unceasing muscular action. The muscles are highly complex organic compounds, in which sulphur exists in an unoxydized state; and the muscular action is accompanied, if not caused, by an action of oxygen, which, among other results, gives rise to the formation of sulphuric acid and urea; the amount of oxidation being proportioned to the intensity of the muscular action. The result produced is an increase of the sulphates and of the urea in the urine, just as in health they would be increased if continued strong exercise was taken. The increased amount of urea does not constitute a disease resembling diabetes, but it is only an evidence of the changes which are taking place within.

The increase of sulphates and phosphates of the brain is also an evidence of increased oxidation of the nervous structures. These simultaneous variations depend on the fact, that the amount of sulphur in the brain is nearly the same as the amount of phosphates.

Thus, at one time we have evidence of increased oxidation of the elements of the nervous structures, and, at another time, increased oxidation of the elements of the muscular structures, and we may thus arrive at the conclusion, that, at one time, the function of the nerves, and, at another, that of the muscles is inordinately increased.—*Med. Gazette, July* 11, 1851, *p.* 81.

21.—*Chorea: Treatment by Chloroform in Frictions.*—Chloroform is an agent which will eventually become an extremely powerful instrument in obtaining very varied results. Since it deadens sensibility, it must calm and even completely appease the different states of over-excitement of the nervous system. We cannot therefore be surprised that Dr. Gassier has performed three cures of chorea by making, along the course of the vertebral column, frictions with a liniment composed of chloroform and oil of sweet almonds, in equal parts. But what is remarkable in these three cases is, that they were all caused by fear. Thus, then, there did not exist any initial morbid state; an accidental nervous derangement was developed on a particular occasion, and nothing more. In such circumstances, chloroform has stopped the chorea; but if the temperament had been concerned, as in cases which are developed without appreciable moral cause, chloroform would not have sufficed, but it would have been necessary to have recourse to other means.—*London Journal of Medicine, August,* 1851, *p.* 722.

22.—CASE OF TRAUMATIC TETANUS.

Under the care of E. Cock, Esq., at Guy's Hospital.

[In the following case, and in several others terminating in the most favourable manner, the administration of quinine seems to have been attended with the most happy results. W. H., aged 18, was admitted on the 28th of January, 1851. His arm had been caught by a machine the day before his admission. and presented an unhealthy looking and jagged-edged wound, about two or three inches in length, on the outer side of the wrist—a good deal of general œdema—but no direct evidence of fracture. Higher up, about the middle of the forearm, was a hard strip of skin, of a peculiar dark colour, half an inch broad, having a very defined upper border, and extending nearly half round the circumference of the forearm, and having very much the appearance of tough bacon rind. The next day the generally mottled appearance, and the loss of sensibility, announced that gangrene had set in. On the third day the whole forearm was in a state of complete sphacelus. Mr. Cock divided the hard piece of skin, and made numerous incisions from above downwards. Numerous bubbles of gas escaped with a crepitating noise, and the tight band snapped, when divided, like a piece of over-stretched tape. On the 4th day mortification did not seem to have further extended, and on the 6th day was clearly stopped. On the thirteenth day ulceration was found to have gradually progressed above the mortified tissue, so as to form a deep fissure down to the bone, and healthy suppuration, with the formation of granulations, is now proceeding from the tissues above.]

Nineteenth day. Up to this date, since the slight operation above detailed, the patient has continued very well, until to-day, when Mr. Stocker perceived an expression of countenance like that of tetanus, the most obvious symptom being, however, the partial manner in which he opens his mouth when asked to show his tongue. On being questioned

the boy says he feels some stiffness of the jaw. There are marked transverse wrinkles in the forehead from contraction of the occipito frontalis. The abdomen is hard, and the bowels confined. Pulse increased in frequency, 96. A dose of compound senna mixture was given immediately, and Mr. Cock resolved to attack the disease at once by the tonic plan of treatment. He therefore ordered three grains of disulphate of quina every fourth hour, and the allowance of wine was increased from eight to twelve ounces per diem. On the second day after the first tetanic symptoms, the patient complained of some stiffness of the neck, otherwise there was no material change. Pulse 88. When sleeping, the transverse wrinkles of the forehead were not so much marked. The wound continues healthy, and the bowels have been relieved.

Third day. The trismus is increasing, muscles of the abdomen very hard, but no pain. Pulse 84. Passes a sufficiency of urine.

Eighth day of the tetanic attack. The trismus has gradually increased to this date, and may now be called complete. The patient can merely show the extreme tip of his tongue, and takes food by a spoon with great difficulty; his appetite, at the same time, is very good. As regards other tetanic symptoms, they chiefly consist in some stiffness of the retractor muscles of the head and neck, and an occasional darting pain there felt, as well as considerable hardness of the abdominal walls. Bowels occasionally confined, and acted upon by rhubarb and saline purgatives; passes urine well; stump continues to look healthy, with common water-dressing.

Tenth day. A little more capability of moving the lower jaw now exists: the bowels, however, have become obstinately confined, and strong purgatives and injections are requisite to obtain any action; stump healthy.

Thirty-eighth day. The tetanic symptoms have gradually subsided during the last four weeks, and may now be said to have quite disappeared; the only difficulty has been in obtaining proper action of the bowels. Croton-oil has been found the most serviceable; but since getting up from bed a few days since, and moving about the ward, the bowels have acted naturally. The patient has continued to take the quinine and wine, and the stump has remained very healthy.

April 8th, being the ninth week after admission. Mr. Cock had intended, now that all tetanic symptoms have subsided, to have removed the denuded portion of humerus, and adjusted the naturally existing flaps, so as to form an useful stump; but to-day, on applying very gentle force, a large piece of the bone (consisting of the whole of the condyles and articulating surfaces, and a splinter, one or two inches long, of the shell of the shaft) came away. Nothing further therefore was done, as it was considered that the portion of bone left was living, and would give rise to granulations, and the formation of an investing tissue.

April 25th, eleventh week after admission. At this date, the patient left the hospital, the bone had become covered by granulations, on a level with those which had arisen from the natural flaps, and which were nearly cicatrized over at the last date. There is now every prospect that the whole will soon be healed, and a very serviceable stump formed.

About a fortnight after his discharge, the lad presented himself at the

hospital, when the whole of the stump was found to be covered by a sound cicatrix, and the cure completed; thus furnishing a most interesting and instructive lesson as to the resources of the *vis medicatrix naturæ*.—*Lancet, June* 28, 1851, *p.* 697.

23.—*Traumatic Tetanus controlled by Quinine.*—M. Coste, chief surgeon of Hôtel Dieu of Marseilles, has published, in 'L'Union Medicale,' the case of a boy sixteen years of age, who was attacked by tetanus in consequence of a contused wound of the toes. The disease was arrested by large doses of disulphate of quinine (maximum forty-five grains in one day), after bleeding, baths, &c., had in vain being resorted to. The cure was accomplished in about a fortnight. If we mistake not, quinine has been used in this country for the same affection, but without beneficial results.—*Lancet, July* 5, 1851, *p.* 10.

24.—*Tetanus treated by Chloroform Frictions.*—'L'Union Médicale' states that M. Morisseau, surgeon to the hospital of "La Flèche," succeeded in saving a patient seized with tetanus, by using frictions of chloroform all over the body. M. Morisseau had, in two cases previously treated, tried, in one venesection and opium, and quinine in the other: both had failed; and he had thus been induced to make attempts with chloroform. A few accidental vapour-baths, and frequent frictions with the anæsthetic agent, brought on recovery in the space of four days.—*Lancet, August* 9, 1851, *p.* 131.

25.—CASE OF EPILEPSY TREATED BY TRACHEOTOMY.

By W. H. Cane, Esq., Uxbridge.

[In the case of a boatman, suffering under an extreme epileptic seizure, after which he was left in a state of deep apoplectic coma with asphyxia, inspiration being performed only by seldom and short catches, whilst the veins in the head and neck were every where visible, and greatly distended, Mr. Cane, after the patient had remained in this state nineteen hours, determined to perform the operation of tracheotomy; acting upon the suggestion of Dr. Marshall Hall, that as the epileptic or other convulsion implied closure of the larnyx, with expiratory efforts, the attack of convulsive epilepsy would be prevented by that operation.]

"Feeling convinced," Mr. Cane observes, "that the patient must shortly expire, and that the root of the evil was in the closure of the larynx, I at once proceeded to open the trachea, a matter of no small difficulty, on account of the twisted state of the neck, the engorged state of the vessels, and the constant action of the muscles. The operation of tracheotomy was performed, and the tracheal tube is kept in the trachea to the present time. The relief to the patient was immediate;

the air passed into the lungs, the state of spasm subsided, with the turgid condition of the head and neck, and the patient soon recovered his sensibility. This was not the only gratifying result: although the poor man had experienced his epileptic seizures in increasing violence during seven or eight years, and recently thrice a week, he had, on April 1st, during two months, had no return of them. More recent accounts of the patient, who is now in Staffordshire, confirm the former report; the tube is still kept in the trachea, and the epileptic seizures have not recurred."—*Lancet, July* 12, 1851, *p.* 35.

DISEASES OF THE ORGANS OF RESPIRATION.

26.—ON THE DIAGNOSIS OF PHTHISIS.

By Dr. Walter Haryle Walshe, Physician to University College Hospital, &c.

In speaking of the diagnosis of phthisis, Dr. Walshe lays down the following highly practical and useful propositions:

"(*a.*) A young adult who had an obstinate cough, which commenced without coryza, and without any obvious cause, a cough at first dry, and subsequently attended for a time with watery or mucilaginous looking expectoration, and who has wandering pains about the chest, and loses flesh, even slightly, is, in all probability, phthisical. (*b.*) If there be hæmoptysis, to the amount of a drachm even, the diagnosis becomes, if the patient be a male, and positively free from aneurism or mitral disease, almost positive, (*c.*) If, in addition, there be slight dulness under percussion at one apex, with jerking, or divided and harsh respiration, while the resonance of the sternal notch is natural, the diagnosis of the first stage of phthisis becomes next to absolutely certain. (*d.*) But not absolutely certain; for I have known every one of the conditions in *a*, *b*, and *c*, exist (except hæmoptysis, the deficiency of which was purely accidental), when one apex was infiltrated with encephaloid cancer, and no cancer had been discovered elsewhere to suggest to the physician its presence in the lung. (*e.*) If there be cough such as described, and permanent weakness and hoarseness of the voice, the chances are very strong (provided he be non-syphilitic) that the patient is phthisical. (*f.*) If decidedly harsh respiration exists at the left apex, or at the right apex behind; if the rhythm of the act be what I have called *cogged-wheel,* and there be dulness, so slight, even, as to require the dynamic test for its discovery, there can be little doubt of the existence of phthisis. (*g.*) If, with the same combination of circumstances, deep inspiration evokes a few clicks of dry crackling rhonchus, the diagnosis of phthisis, as far as I have observed, is absolutely certain. (*h.*) If these clicks, on subsequent examination, grow more liquid, the transition from the first to the second stage may be positively announced. (*i.*) If there be slight flattening under one clavicle, with deficiency of expansion

movement, harsh respiration, and slight dulness under percussion, without the local or general symptoms of phthisis, the first stage of tuberculization cannot be diagnosed with any surety, unless there be incipient signs at the left apex also; the conditions in question, limited to one side, might depend on chronic pneumonia or on thick induration matter in the pleura. (*k.*) The existence of limited though marked dulness under one clavicle, with bronchial respiration and pectoriloquy, so powerful as to be painful to the ear, the other apex giving natural results, will not justify the diagnosis of phthisis. I have known this combination when the apex of the lung was of model health, and a fibrous mass, the size of a walnut, lay between the two laminæ of the pleura. I would even go farther and say, that the combination in question is rather hostile than otherwise to the admission of phthisis, as, had tuberculous excavation formed at one side, the other lung would, in infinite probability have been affected in an earlier stage. (*l.*) Pneumonia limited to the supra and infra-clavicular reign on one side, and not extending backwards, is commonly, but not always tuberculous. (*m.*) Subcrepitant rhonchus, limited to one base posteriorly, is not, as has been said, peculiar to tubercle; it may exist in emphysema, and in mitral disease. (*n.*) Chronic peritonitis, in a person aged more than fifteen years, provided cancer can be excluded, involves, as a necessity, the existence of tubercles in the lungs. To this law of Louis' it is necessary to add the qualification, provided Bright's disease be also absent. (*o.*) Pleurisy with effusion, which runs a chronic course in spite of ordinary treatment, is, in the majority of cases, tuberculous or cancerous: the character of the symptoms, previously to the pleurisy, will generally decide between the two. (*p.*) Double pleurisy, with effusion, is not, as has been said, significant of tubercle; for it may depend on Bright's disease. If the latter disease can be excluded, carcinoma and pyohæmia remain as other possible causes. (*q.*) If a young adult, free from secondary syphilis and spermatorrhœa, and not dissolute in his habits, speedily lose flesh without clear cause, he is, in all probability, phthisical, even though no subjective chest-symptoms exist. (*s.*) But he is not by any means certainly so, for he may have latent cancer in some unimportant organs, or he may have chronic pneumonia. (*t.*) Nay, more, he may steadily lose weight, have dry cough, occasional diarrhœa, and night sweats, and present dulness under percussion, and bronchial respiration under both clavicles, and yet be non-phthiscial. I have known all this occur in cases, both when the lungs were infiltrated superiorly with primary encephaloid cancer, and when they contained secondary nodules of the same kind. (*u.*) Failure of weight becomes less valuable as a sign of phthisis, the longer the thirtieth year has been passed. (*v.*) The discovery of cardiac disease with marked symptoms, deposes against, but does not exclude, the existence of active tuberculization. (*w.*) The existence of cancer in any organ is unfavourable to the presence of tuberculous disease, but tubercle and cancer *may* co-exist, even in the same lung."—*Brit. and For. Medico.-Chirurg. Review, October,* 1851, *p.* 303.

27.—ON THE PATHOLOGICAL SIGNIFICATION OF SOME OF THE EARLY AUSCULTATORY SIGNS OF PULMONARY CONSUMPTION,

CONSIDERED WITH REFERENCE TO THE PRESENCE OF TUBERCLE.

By Dr. Stanhope Templeman Speer, Cheltenham.

[Dr. Speer does not incline to the general opinion that the pathology of pulmonary consumption, in the widest acceptation of the term, is dependent upon the presence of tubercle in the lung; neither does he think the varied phenomena are one and all to be attributed to this cause. He says:]

That tubercles do exist in the large majority of cases, characterised by all the symptoms of the disease, is undeniable: that they are the primum mobile, or promoter of such symptoms is, to say the least, extremely doubtful. I am, on the contrary, inclined rather to consider this affection as a scrofulous inflammation of the lung, and to attribute its symptoms to the ordinary results of this process, modified by the peculiar products, which, in the majority of cases, are the results of this peculiar form of inflammation.

It has been asserted by many writers (and more especially by some of the most eminent of the French pathologists) that in no case can tubercles be considered as the product of inflammation; and M. Louis, in his able work on Phthisis, has brought forward numerous examples to prove the fact. On careful consideration, however, of these cases, it would appear that he has merely proved that an ordinary inflammation, whether of the bronchial mucous membrane or of the pulmonary parenchyma, never tends to the deposition of tubercle. It is needless, however, to say that inflammation is not a process limited to one exact type: true, in its usual form it proceeds generally to the formation of healthy pus, or organizable lymph; but, on the other hand, are not the rheumatic, the gouty, and the syphilitic inflammations, each marked by products of a different character, and by a variety in their symptomatic phenomena? and are we not, then, at liberty to assume that there exist certain conditions of the body of an inferior grade of vitality, with a tendency to a corresponding type of inflammation equally characterized by a similar grade of action, giving rise to the production of a deposit incapable of complete or further organization? Such appears to be the case as regards the deposition of tubercle in very many instances. Not but that, on the other hand, it may happen that this peculiar inflammation will sometimes go on to the destruction of the tissues involved by suppuration and disintegration, while after death no trace of tubercle can be discovered, but only that peculiar kind of product which, in other parts of the body, is denominated scrofulous pus.

Upon this point I may venture to quote the following apposite remarks from so eminent an authority as Dr. Graves. He says:—"The most important thing for the student to impress on his mind with regard to all cases of phthisis is, that the pectoral symptoms, of whatever nature they be, are caused by scrofulous inflammation. If you trace the phenomena of external scrofulous abscesses, you will be struck with the close analogy they bear in their manner of appearance, their progress

and termination, to the ulceration of the lungs. The same slowness; the same insidious latency; the same gradual solidification and gradual softening; the similarity of the puriform fluid secreted in each; the analogous occurrence of burrowing ulcers and fistulous openings; the close approximation in the form of their parietes, and the difficulty in healing remarked in both, make the resemblance between them extremely striking." Again, he says,—"I mentioned before that one of the first morbid changes we generally see arising from the scrofulous habit is the formation of tubercular matter. I have also alluded to another of these morbid changes—namely, the production of scrofulous pneumonia, in which we cannot detect the existence of a single tubercle. There is another process in which the scrofulous inflammation is seated in the bronchial mucous membrane. This latter form of phthisis is sometimes associated with phthisical pneumonia, but it often exists without it. Although in this disease the inflammation is seated in the bronchial mucous membrane, it differs very much from common bronchitis: its symptoms are different; it does not run the same course; and it is unlike common bronchitis in its termination and cure: its fever presents all the material phenomena of phthisis—emaciation, and frequently the same incurability; the same means tend to its aggravation or benefit, and the same scrofulous pus is secreted."

Now, if we admit the existence of these different forms of scrofulous disease affecting the lung, either separately or (what is more commonly the case) in conjunction,—namely, scrofulous inflammation leading to the deposition of tubercle; scrofulous inflammation (pneumonia), in which no trace of tubercle is found after death; and scrofulous bronchitis, in which a characteristic purulent fluid is found filling the tubes; allowing, I say, these three forms to exist, and that either of them may, at its origin prove to constitute the incipient stage of phthisis, we have then some clue to the diversity in those morbid physical phenomena which are collectively supposed to indicate the disease without specifying its peculiar form; for while the general symptoms may, in all probability, be nearly identical, it is obvious, from the different pathological conditions which must exist in these three varieties, that a corresponding difference in the physical signs must necessarily be present. Thus two cases, equally deserving of the term phthisis, as meaning a wasting away, with destructive disintegration of the pulmonary tissues, may in reality afford a difference in the progress and existence of such signs (more especially at their commencement) in no way to be accounted for but by the admission of a pathological difference in the morbid processes at work in the two cases.

The foregoing observations are made in the conviction that the disease called phthisis pulmonalis is in reality a scrofulous inflammation of the lung; that it is, in the large majority of cases, accompanied by the deposition of tubercles; but that in certain forms of the disease (especially in elderly persons) this is by no means invariable; and that when present, they are the product, and not the real cause of the disease; since all the characteristic symptoms of scrofulous inflammation are identical, whether true tubercle be thrown out or not—viz., low fever, quickened pulse, emaciation, hectic, perspirations, diarrhœa. To be

satisfied of this, we have but to compare a case of hip-joint disease in its progress from first to last with one of pulmonary consumption: the analogy will be indeed evident.

It is, however, true that sometimes the deposition of a considerable amount of tubercular deposit may take place in the lung, preceded merely by simple congestion or capillary hyperæmia,—a condition supposed to be always present by Vogel and by Engel; the latter, however, limiting the influence of inflammation to the production of infiltrated tubercle. May not, however, this deposition at so early a stage of the inflammatory action be merely a proof that there exists in persons of an eminently tubercular diathesis, a step short of actual inflammation (viz., simple hyperæmia, sufficient in itself to provoke the deposition of tubercle from its blood-vessels; whilst in others the process must attain its ultimatum—the true inflammatory condition (of a scrofulous type)—before the characteristic deposit of such type becomes manifest.

Again: it is often alleged that the fact of tubercles (isolated or in masses) being not unfrequently found in the lungs of persons dying of other diseases, in whom the parts occupied by these tubercles, and surrounding them, were to all appearance healthy, is a proof of their deposition being independent of any inflammatory process. I have myself frequently seen tubercles in the upper part of the lung, lying apparently inert, surrounded by healthy tissue; no symptom of inflammatory degradation being appreciable: but the absence of such appearance by no means satisfied me that an early stage of inflammation—viz., hyperæmia —had not preceded the deposition; it rather goes to prove that tubercle does not produce of itself any change in the surrounding parts, and that the suppuration and disintegration of the pulmonary tissue found around it in cases of phthisis, are in no way a necessary consequence of irritation produced by the tubercle, and may exist totally independent of its presence.

The appearance of tubercle without any trace of inflammation in its vicinity is, as I said before, no proof of the absence of such process at the time of its deposition. In assigning inflammation, however, as the *avant courier* of these latent products, I allude simply to its incipient stage, that of local excitement, with increased flow of blood, but without organic change; and consequently the absence of any indication of such process is explicable upon the following supposition:—That (in persons who, after death, presented evidence of latent inert tubercle), owing to a combination of depressing causes greatly lowering the vital powers, a condition of simple irritation or congestion was sufficient to give rise to the deposition of a certain amount of tubercular matter from the vessels of the congested part; and that these vessels, once freed from this material, and the predisposing causes giving rise to its formation in the blood having ceased, returned to their former condition without any advance in the morbid process, which, owing to a combination of circumstances, had at so early a period been sufficient to permit of its exit from the pulmonary capillaries. Should, however, its elimination require a process of a more advanced type for its accomplishment—viz., actual inflammation—we at once see how the peculiar symptoms of phthisis may become manifest. In the first instance the morbid action ceased upon

the deposition of the tubercle; resolution took place, and the substance remained inert; in the second, the usual results of inflammation followed or accompanied such depression—namely, suppuration, and ulceration of a modified type; not, indeed, resulting from the presence of the tubercle, but from the fact that the process having now attained the inflammatory stage, the ordinary consequences of inflammation will of necessity occur, whether tubercle be thrown out or not; these consequences—the suppuration and ulceration, and not the tubercle—leading to the softening and destruction of the tissues in which the latter has been lodged.

Lastly, if tubercles are to be considered as the primary cause of the irritation, inflammation and other symptoms which are presupposed to occur subsequent to its deposition, there is some difficulty in understanding why the lung, and especially its upper lobes, should be so peculiarly obnoxious to their existence: but if we allow a state of hyperæmia to have preceded their deposition, the difficulty is in a great measure removed; for, in the first place, it is only necessary to bear in mind the delicate structure of the lungs allowing the easy exudation of the materies morbi through the thin texture of its capillaries. The mass of blood which passes through them as compared with other organs; the chemical change in that fluid which takes place here, and here alone; the abundant formation of fibrin (of which tubercle is but an inferior form); and, to add to these conditions, the fact, that of the different organs in which tubercles are found, the lungs alone are subject to those external peculiarities of atmospheric vicissitudes, so fertile in inducing an irritable congested state in tissues of so delicate a texture. Abrupt changes of temperature are universally allowed to favour the development of pulmonary affections, and more especially of phthisis, in persons predisposed to the disease; but surely it must be by the variety in the intensity of stimulus afforded to the pulmonary tissues, producing an excited irritable condition, and thus leading to the deposition of tubercle, rather than by any specific action possessed by such atmospheric influences in promoting its deposition, independent of a preliminary morbid process, however slight.

The above considerations may serve to explain the reason for tubercular matter being so generally found to preponderate in the lungs: its choice, however, of the upper lobes is more obscure.

Now it is well known that tubercle may be deposited with little, if any, derangement in the circulation of the part; but when this does occur, the deposit assumes the form of crude yellow tubercle from the first, without having been preceded by the grey miliary induration, from which, in the majority of instances, it appears to have been formed. But this primary form of crude yellow tubercle, which appears to be so independent of any preliminary irritating process, is not that which is found to predominate in the upper lobes: it is the miliary tubercle and the grey induration which are so common in these parts of the lung in the earlier stages of phthisis; and these latter conditions being undoubtedly the result of a low grade of inflammation, the question is not why the upper lobes should be so liable to this deposition, but why they should be more particularly so, to that species of in-

flammation which gives rise to it; since (notwithstanding the frequency of ordinary pneumonia of the lower lobes, and also of one form of bronchitis—the capillary) it is certain that the upper portion of the respiratory apparatus is far more liable to irritation, congestion, and inflammation, of one kind or another.

In the first place, these upper lobes are the seat of a higher degree of activity in the respiratory process; the louder character of the murmurs, is one indication of this; but this superior activity of function is also a sign of a corresponding activity in the circulation of these parts. This alone would render the upper lobes more keenly susceptible to the irritation of external stimuli, independent of the existence of a tubercular diathesis; but as this condition of the system has the effect of implanting a lower degree of vitality and proportionately diminished powers of reaction in all the tissues, it is plain that those of the upper pulmonary lobes must now be more incapable of resisting with impunity the varied sources of irritation to which they are liable. Another reason tending to account for this susceptibility is found, I think, in the opinion of Broussais, that in these parts the bronchial tubes are shorter, and allow the external sources of irritation to arrive more readily at their termination. This argument certainly holds good with respect to the atmospheric air, if its temperature be low or variable, since, owing to the shortness of the space which it has to traverse, it cannot have its temperature increased or assimilated to that of the surrounding parts, so readily as when it has to attain the more distant portions of lung. Again, in spite of the superior activity of the respiratory functions in the upper lobes, it is in these that the least amount of assistance to the alternate expansion and contraction of the lung is afforded by the movement of the thoracic parietes, the deficiency requiring to be compensated for, by an increased action in the lungs themselves; and that such an active condition of certain of the pulmonary tissues does occur, independent of the movement of the thorax, has, to my mind, been satisfactorily shown by the elaborate researches of Reissenen and others. Lastly, this diminished mobility may, according to Dr. Williams, act in another way:—he says, "the smaller capability of motion possessed by the upper lobes of the lung may have a share in disposing them to become the seat of tubercular matter, not by permitting it to accumulate, but by favouring bronchial obstructions to the respiration, and causing local congestions of blood, which may promote the formation of tubercles."

Before proceeding further, the following propositions may serve to embody the views entertained upon this subject:—

1st. That the tubercular and scrofulous diathesis are identical.

2d. That inflammation of the pulmonary substance is modified by this diathesis; its products being either scrofulous pus or what may be termed scrofulous lymph or tubercle; both these products being possessed of an inferior degree of organization.

3d. That in the great majority of instances the earliest phase of phthisical disease is ushered in by local excitement of the air-vesicles and smaller air tubes.

4th. That this local excitement differs essentially from the analogous

condition existing at the commencement of an ordinary sthenic inflammation, in its gradual supervention, its difficulty of recognition, and its slowness in passing into a more advanced stage.

5th. That all the symptoms of phthisis are the result of scrofulous inflammation of the lung, whether pus or tubercle be thrown out, or both.

6th. That, where the tubercular diathesis is very strongly marked, tubercle may be deposited, as the result of a very trifling amount of local irritation.

7th. That in a large number of cases it is not deposited, till the morbid process has attained the true inflammatory stage.

8th. That the auscultatory signs of incipient phthisis may be divided into—1st, those which occur in cases where the tubercle is thrown out simultaneously with or subsequent to the local excitement; 2dly, those in which it is not deposited till this stage of excitement has become merged in actual inflammation of a specific character.

Lastly. That incipient phthisis may present all its characteristic symptoms before any tubercular matter has been hitherto eliminated.—*Med. Gazette, June* 13, 1851, *p.* 1027.

28.—*Symptoms of the First Stage of Phthisis.*—[From a concise practical guide to the physical diagnosis of Consumption.] By Dr. R. Payne Cotton, Assistant Physician to the Hospital for Consumption and Diseases of the Chest.

The following are laid down by Dr. Cotton as the signs of the first stage of phthisis.

Bulging of the infra-clavicular origin, with increased or diminished resonance.

Retraction of the same region, with imperfect resonance.

Imperfect expansion. Elevation of the thoracic parietes must not be confounded with their expansion.

Increased vocal fremitus.

Increased distinctness of the heart's sounds under the clavicle.

Jerking or rough inspiration.

Prolonged or bronchial expiration.

Pulmonary crumpling sound, or a few dry crackling ronchi. The signs of bronchitis limited to one or both apices.

In determining the importance of these signs, it must be borne in mind that expiration, as shown by Louis, is, in a certain proportion of healthy individuals, somewhat prolonged, and the vocal fremitus and resonance comparatively strong under the right clavicle.—*Med. Times, April* 19, 1851, *p.* 431.

29.—OBSERVATIONS ON THE FORM AND MOVEMENT OF THE CHEST IN PHTHISIS.

By Dr. Richard Payne Cotton, Assistant Physician to the Hospital for Consumption and Diseases of the Chest.

[Dr. Cotton's observations lead him to believe that the best formed chests afford no security against the onset of the disease: and the ill-developed or even deformed chest does not seem more liable to become

the seat of tubercle. Before considering the form as influenced by phthisis, he gives a brief reference to the relationship between phthisis and tubercle. He remarks:]

There is a period of the disease, sometimes well-marked, but equally often so short and ill-defined that it escapes detection, which may be termed the *preliminary* stage; it might be called with mere propriety the *first* stage, but this title has been too long applied to a somewhat later period to admit of being changed. Consumption has now commenced. The tuberculous elements exist in the blood, but are not yet separated from it in the form of tubercle. This period passes into the tubercular or *first* stage; in some cases the tubercle is formed very rapidly; but in others, it may take months, or even years, for its accumulation to any notable amount.

The tubercular deposit consequently should be considered as the *effect* of phthisis, and as bearing precisely the same relation to this disease as the lithate of soda does to gout; and, just as a patient may be gouty without having the movements of his joints affected by "chalk-stones," so may any one be phthisical without having the functions of the lungs interfered with by tubercle. The really phthiscial symptoms, at the commencement of the disease, depend, not upon the state of the lungs, but upon the morbid condition which has produced it. It is true, that in the latter stages, much of the patient's suffering is a direct consequence of the pulmonary disease; but, at an earlier period, the general features of the malady—the weak and quickened pulse—the languid expression—the perspirations, &c.—depend entirely upon the *phthisis*, not upon the tubercle.

From this view of the subject it must follow, that phthisical symptoms may present themselves in connexion with every possible degree of pulmonary disease,—from a few scattered tubercles, which are scarcely appreciable, to their accumulation in considerable masses; and that *incipient* phthisis is not *always* discoverable by a physical examination of the chest. If this had been more fully admitted by writers upon these subjects, the stethoscope would have been often spared unmerited discredit.

We will assume, however, that the disease has fairly reached its *first* stage, and that the tubercular deposit is sufficiently abundant to interfere with the proper functions of the lung. In what manner is this exhibited by physical signs? Are the form and movements of the chest necessarily altered? These are questions which cannot be answered by an appeal to individual cases, on account of the well-known Protean character assumed by the disease, and are only to be met by continued observation upon such a scale as an hospital, like that at Brompton, can alone afford.

As a general rule, the form of the chest is unchanged, and the action of its two sides are symmetrical. In a few instances, there is a slight bulging over the diseased part, but, owing either to its rarity, or the shortness of its duration, it is not very often to be detected. Auscultation and percussion are now the sole guides to the condition of the lungs—points, however, upon which it is not my present object to enter.

I have always been aware that such a statement may be met by the

very plausible argument, that directly the apex of a lung becomes tubercular, it must necessarily lose some of its capability of being expanded, and, as a natural consequence, the portion of the thoracic walls corresponding with the seat of the disease, must undergo a change in form, and be less moveable than the opposite side. But I think it can be shown how it happens that, in most cases, neither of these alterations are immediately apparent, and that the chest may retain, for a time at least, its healthy form, as well as its long-accustomed habit of equal and simultaneous motion.

There are two ways by which it does so, viz,: 1. The movement of the healthy side becomes diminished to the same extent as the other, so that the ordinary breathing, instead of being partly costal, as we find it in health, is almost wholly abdominal. 2. The pulmonary cells in the immediate neighbourhood of the tubercular deposit become enlarged, and by increased capacity for air, compensate for those which are disabled.

The first is less common than the other, but its occurrence may be witnessed in certain cases (of which I have seen many examples), where, although it is evident from other signs that one lung only is affected with tubercle, the thoracic movement upon both sides is small but equal, except on very deep inspiration, when the diseased side is less raised than the other. The second may be seen in the many cases of early phthisis, in which the respiratory sound upon the diseased side is actually louder than on the other, and in the still more numerous instances, in which the murmur at the tuberculous apex is scarcely audible in some points, and morbidly loud in others; both of which conditions must be familiar to every experienced auscultator. It is probable that the first takes place in cases where *miliary* tubercle is scattered throughout the greater part of the lung's apex; and the second, where the tubercular deposit is in somewhat larger masses, and accumulated in particular spots.

The occasional bulging over the diseased part, first observed by Dr. Chambers, is yet additional testimony in favour of the second explanation; for when the portion of the chest so altered is percussed, it is often found to be more resonant than the healthy side, apparently in consequence of an extreme degree of enlargement of the pulmonary cells, amounting to emphysema.

But, after a time, which varies very much in different cases, circumstances are entirely changed; the diseased portion of lung *begins to contract,* and the thorax undergoes an alteration in form, not only in the region of the clavicles, but in its whole contour. M. Fournet referred this contraction to secondary pleurisy; Dr. Stokes has attributed it to atrophy of the lung; and Dr. Walshe has added to these, the contraction of plastic matter exuded into the pulmonary tissues. It is probable that these different causes are sometimes associated; but one or more of them must be present, before the form and action of the chest can be materially interfered with.

In the majority of phthisical cases, their effects begin to appear towards the middle or latter end of the first stage; but examples are sufficiently numerous of their being completely absent until softening has commenced.

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I shall describe the several changes which are thus produced, as they are seen when in their extreme; premising, that the greatest variety will be met with, both in the rapidity and extent of their development.

The vertebræ of the neck and back are inclined forwards, and the shoulders are rounded; the front of the chest is consequently contracted, and the stature of the body lessened, giving an awkwardness to the whole appearance, difficult to describe, but which any one accustomed to the external aspect of the disease, would at once refer to the *tubercular chest*. If the patient be looked down upon whilst he is sitting, two curves are distinctly visible; the one affecting the whole line of the cervical and dorsal vertebræ, the other crossing it, and formed by the two shoulders inclining forwards. A depression is visible beneath one or both clavicles, giving to these bones the appearance of prominence; and, posteriorly, the supra-scapular region over the diseased part is more or less sunken inwards. During ordinary breathing, either there is no costal movement whatever at the upper part of the chest, or there is a difference in its extent upon the two sides; and, on forced respiration, instead of the peculiar *swelling* movement of the infra-clavicular regions which is so characteristic of health, either one side is elevated more than the other, or the entire chest is raised, as it were, in one mass, without being perceptibly increased in the antero-posterior diameter of its upper part. These latter changes are more conspicuous in females than in males, as the healthy respiration in our sex is principally abdominal, whilst in females—owing to the restriction of stays, or for reasons which the obstetrician is the best able to appreciate, there is greater freedom of movement in the upper ribs, and the breathing is, to a much greater extent, costal.

The loss of symmetry and healthy movement take place simultaneously; so that, unless there is some depression in the clavicular or supra-scapular regions, there will be no diminution in the ordinary movements of these parts. M. Fournet was, I believe, the first who drew attention to this circumstance; and I have certainly never seen an exception to it.

The changes above described may occur at any period of phthisis, from that antecedent to softening, to that of large vomicæ; but they are very capricious guides to the actual stage of the disease; for persons with cavities in the lungs very often are less altered, in these respects, than others who have scarcely entered the second stage. The different amount of pulmonary-contraction which must accompany different cases, will at once account for these varieties.

From the preceding observations, I think it must be evident that inspection and mensuration of the chest can seldom afford assistance in the diagnosis of *incipient* phthisis; although, as the disease advances, they may prove useful auxiliaries to other physical signs. But when it is remembered that a departure from strict symmetry is occasionally seen in healthy persons, as a consequence either of a congenital peculiarity, or of certain pursuits which influence the development of the thorax, it is obvious that much caution is always necessary in their employment.—*London Journal of Medicine*, *July* 1851, *p.* 616.

30.—ON A PECULIAR APPEARANCE OBSERVED IN THE GUMS OF CONSUMPTIVE PATIENTS.

By Dr. Theophilus Thompson, F.R.S., Physician to the Hospital for Consumption and Diseases of the Chest.

[Dr. Thompson was encouraged to examine the state of the gums in a poisoned or morbid condition of the blood, from the value of their indicating the presence of lead in the system, by the blue line upon their edge.]

He presents the results of his observations in reference to this inquiry in cases of consumption, and avows his conviction of the frequent existence in phthisical subjects of a mark at the reflected edge of the gums, deeper in colour than the adjoining surface; in some patients a mere streak on a raised border, in others, a margin more than a line in breadth, of a vermilion tint, inclining to lake: the mark being most distinct around the lower incisors, but usually observable in both jaws, and often around the molar, but modified in its situation by the form of the mouth. The author has examined some hundred cases in the course of the investigation, and gives the analysis of 102, of whom he has full records. In forty of forty-eight women the gingival margin is present; and in fifty-four phthisical men, although in a few the line is so faint as to be open to question, there is only one in whom it can be considered decidedly absent. He has reasons for suspecting that the same condition of the system which produces this state of the gums tends also to produce clubbing of the fingers; but he considers that the change in the extremity of the fingers rarely occurs till some time after the streak is manifest in the gums. Of seventy-six patients, forty-five were found to have clubbed fingers; of these forty-five only one had gums free from the characteristic margin; yet twenty of the seventy-six had marginated gums, but no expansion of the extremities of the fingers. The author discusses the effect of various modifying influences, such as hereditary tendency, catamenial disturbances, and habits as respects cleanliness, but cannot connect the presence of the symptoms in question with any of these circumstances; but he is of opinion that causes which irritate the mucous membrane tend to accelerate and increase the manifestation of the margin. He suggests this as an explanation of the more frequent absence of the line in women than in men, and dwells on its practical importance, as indicating, in such cases, the use of refrigerants as preliminary to the introduction of tonic remedies. The author canvasses the question whether a similar line exists in any other disease; he allows that M. Fredericq may be correct in the opinion that certain changes in the gums occur towards the close of various chronic diseases, but he has never yet observed the peculiar margin described in this communication, without detecting other indications of consumption, although frequently only incipient. As respects prognosis in phthisis, he proposes the general rule, that cases in which the streak is observed early, or is broad or deep-coloured, tend to proceed more rapidly than those in which it is absent or slight; whilst freedom from the streak, even in the third stage, affords encouragement in treatment. In reference to diagnosis, the author believes,—1st. That the absence of the

streak in men affected with inconclusive symptoms of phthisis, may incline us to a favourable interpretation of any such suspicious indications; but that in women, rather less weight is to be attributed to this negative sign. 2nd. That the presence of the sign in women is almost conclusive evidence of the presence of the tubercular element in the blood. The paper concludes with the remark, that the symptom therein described is one of many proofs that consumption is *not* exclusively a local disease, but rather a constitutional condition, requiring for its elucidation and treatment far more than an acquaintance, however exact, with the phenomena of auscultation.—*Lancet, July* 12, 1851, *p.* 35.

31.—ON HÆMOPTYSIS.

By Dr. Theophilus Thompson, F.R.S., &c.

[Although great alarm is generally evinced, and danger of sudden death feared when this symptom is considerable, yet it appears in reality that such is very rarely the case, for]

There are two circumstances in reference to the circulation in phthisical lungs unfavourable to the occurrence of profuse hemorrhage. In inflamed lung, the blood-vessels, though tortuous, are free, but in tubercular lungs the blood coagulates in the extremity of the vessels. But there is an additional point well worthy of your attention. When you look at this large vomica you observe a considerable band passing across it. Of what does this band consist? It contains no bronchial tube. Bronchial tubes readily ulcerate; and by that process expectoration from cavities is promoted. The band consists mainly of blood-vessels and cellular substance. Blood-vessels are inapt to ulcerate. The walls of the pulmonary arteries, when surrounded by tubercular ulcerations, instead of sharing the disorganization, usually thicken; by the deposition of fresh material, their calibre gradually lessens; after a time they cease to be pervious, they are filled with a thin, reddish, fibrinous plug, and transformed into solid chords.

It is probably only in those rare instances in which such a vessel is suddenly torn before the calibre is perfectly closed, that fatal hemorrhage is at all likely to occur. The popular idea that all bleeding from the lungs is produced by ruptured blood-vessels is a serious error. The ordinary cause of hæmoptysis is doubtless compression or obliteration of the pulmonary veins by the tubercular deposit; in consequence of which, blood, interrupted in its natural channels, overflows or exudes into the neighbouring bronchi. If this explanation be correct, hæmoptysis moderate in amount must be regarded rather as beneficial than alarming. By preventing the stagnation of unhealthy blood it must tend to oppose the extension of tubercular disease; and as far as a conclusion may be drawn from the cases under my care, the tendency of hæmoptysis of considerable amount would seem to have been rather favourable than otherwise. You will observe that some of the cases recorded of copious hæmoptysis, were remarkably slow in their progress. In six of the cases the quantity of blood expectorated at once has exceeded a

pint, and the time which has elapsed since the occurrence of the profuse hæmoptysis has been, in these patients, respectively six months, twenty-two months, twelve months, ten months, eight months, and five years; in several of these instances, evidence of pulmonary disease preceded by many months the occurrence of hæmoptysis, and in some the disease has not advanced beyond the first stage. These facts are in harmony with my general experience, as showing that this symptom tends more to retard than to accelerate a fatal issue.

The practical bearing of these facts is obvious and important, as impressing the conclusion that undue haste to arrest hæmoptysis should be deprecated, and that as a general rule it is better to moderate this symptom by producing determination to other organs, than to employ direct astringents. You will find great benefit in many cases from the administration of a dose of calomel or mercurial pill, with henbane, followed the use of half-drachm doses of sulphate of magnesia with diluted sulphuric acid, administered twice a day.

Let me repeat, that hæmoptysis, when slight, is often useful and should not be hastily checked. When it is considerable, if of an active character, as indicated by full, hard pulse, heat and oppression under the sternum, and heaving of the diaphragm, cupping or even bleeding, may be requisite. In less formidable attacks, anti-congestive remedies, and small doses of sulphate of magnesia with sulphuric acid may be given, or antimony with nitrate of potash. Ipecacuanha has been recommended, in doses of two grains every quarter of an hour, but this remedy has disappointed me. If the hæmoptysis be passive, direct astringents may be required, of which alum is one of the best; and perhaps this remedy acts more efficiently when allowed to dissolve in the mouth than when taken in mixture. The following prescription is appropriate for this purpose :—Take of powdered gum-arabic and of white sugar, each three drachms; powdered tragacanth, a drachm and a half; alum, two drachms; catechu, three drachms; rose-water, as much as sufficient for a mass to be formed into sixty lozenges.

The most powerful of direct astringents in the treatment of urgent cases, is acetate of lead. You may give two grains for a dose in a mixture, with half a drachm of distilled vinegar; or if you give it in pill, take care to give acetic acid immedately afterwards, in order to counteract the tendency of the carbonate of lead to produce colic. Gallic acid is not so prompt and effectual as acetate of lead, but suits some cases remarkably well. Turpentine is probably one of the most certain and suitable remedies in a majority of instances. Two drachms of spirits of turpentine, two ounces of mixture of gum arabic, and four ounces of infusion of matico or of cinnamon water, with thirty minims of tincture of capsicum, form an appropriate mixture, of which an ounce may be given at intervals. In slight cases the infusion of matico alone is often sufficient.

When the hæmoptysis is associated with suppressed catamenia and hysterical symptoms, lytta is of great value; but let me repeat the opinion, that in a majority of instances of phthisis moderate expectoration of blood is useful, and that whilst you allay the apprehensions of the patient you may leave the symptom to its own course.—*Lancet, July* 19, 1851, *p.* 53.

32.—ON EXPECTORATION AS A MEANS OF DIAGNOSIS IN DISEASES OF THE CHEST.

By Dr. Theophilus Thompson, F.R.S., &c.

[It is now known that the old supposition, that the presence of pus in the expectoration indicates the existence of phthisis, is totally incorrect, as it may be present in bronchitis and yet absent in consumption. But we must be mindful of the danger of falling into the opposite error, and discarding a symptom which may be of great value to us.]

There are certain general rules worthy of regard in connexion with this subject. Thus, if a person with some severe chest complaint coughs frequently, and expectorates only frothy, salivary-looking fluid, you suspect pleurisy. If another patient expectorates a glairy fluid, resembling white of egg, you suspect bronchitis; if the expectoration have a rusty tinge and resemble gum-water coloured with blood, you are not likely to err in recording pneumonia; if you are told of a sudden expectoration of a gush of pus in considerable quantity, especially if it be fœtid, you would expect to find that matter accumulated in the cavity of the pleura had found its way into the bronchial tubes.

We have said that purulent expectoration may occur both in bronchitis and in phthisis. When, however, long-continued purulent expectoration is unaccompanied with any distinct rhonchus, you may be tolerably certain that the source is a vomica, and not the bronchial tubes. Let us consider to what extent we may derive aid in our diagnosis of the existence and stage of phthisis, from examination of the sputa. We must not expect too much from this, or indeed from any other single symptom. Phthisis may proceed to an advanced period unaccompanied with expectoration, or the expectoration may be for a time suspended, especially under the successful employment of medical treatment.

In this patient, for example, S. A. M., whom you formerly examined, you have unquestionable proof of vomica in the cracked-metal sound, which you readily detect by making smart percussion in the second left intercostal space, but there is scarcely any cough, and that cough is dry. Still there are certain common circumstances regarding phthisical sputa, which may be briefly detailed. A member of a consumptive family feels a little out of health and has a dry morning cough; after a time the cough is attended with slight expectoration, at first salivary, after a short period becoming viscous, but transparent and homogeneous, subsequently dotted, and then streaked with blood, the striæ becoming by degrees more abundant. After a longer or shorter time, whitish opaque spots appear, the size of a pin's head, rounded or flattened, giving a pearly aspect to the expectoration. These multiply and enlarge, and ultimately form masses of an opaque white or dark grey colour, varying in size from that of a lentil to a two-franc piece, irregularly rounded and chequered at the side, sometimes streaked with blood and floating in a viscous, transparent fluid. At a more advanced period of the disease, the expectoration is purulent, spreads out into a porraceous mass, and shortly before death is often surrounded by a pinkish halo

The changes thus described do not necessarily occur in so uniform a manner; but the most characteristic appearances of different stages of

the disease may probably be best illustrated under four divisions — namely, first, the salivary or frothy; secondly, the mucous; thirdly, the flocculent; fourthly, the purulent or porraceous. The first is what you would expect from irritation, the result either of pulmonary congestion or of slight tubercular deposit; the second would indicate a more confirmed affection of the bronchial tubes; the third is peculiarly characteristic of secretion from a vomica modified by the absorption of its thinner constituents; the fourth is indicative of phthisis far advanced, and (if unmixed with froth) usually involving both lungs. Let us see how far such a representation is in harmony with the facts at present accessible in the hospital. I show you some examples of simple frothy expectoration. The first is coughed up, in the quantity of four ounces in the twenty-four hours, by the patient I now introduce. W. G., aged forty-two, a post-boy, admitted into the hospital, Nov. 18, 1850, says, he has been for eight years subject to asthmatical cough; fourteen months since observed some streaks of blood in his expectoration, and during the last fourteen months has been losing flesh; pulse, 84; respirations, 28 a minute; height, five feet two inches and a half; vital capacity, 140. These circumstances are sufficient to make you suspect the nature of the disease; at the same time, the local signs are so slight— being almost confined to the existence of a little dulness on percussion at the apex of the right lung, and rather strongly pronounced breathing under the left clavicle—that we may reasonably come to the conclusion, in harmony with the appearance of the expectoration, that the disease is in the first stage, and not at present considerable. The second variety of expectoration is mucous, viscid, transparent. Two very good examples are before you. This patient, W. D., expectorates half an ounce daily of this kind of fluid; he is a gardener, has no hereditary liability to phthisis, and attributes his complaint to bad diet. He began to cough last August, and at that time expectorated about half a pint of salivary, frothy fluid in twenty-four hours. This patient's pulse is 78; height, five feet four inches; vital capacity, 155. The upper part of the left chest expands less than the right during inspiration, and is rather dull on percussion. The expiratory murmur is prolonged, being equal to the inspiratory at the apex of each lung. There has never been hæmoptysis. The disease is evidently rather more advanced than in the patient previously introduced to you; but as yet there is no softening of tubercle, and the expectoration depends on bronchial irritation. W. D.'s expectoration contains a little blackish matter, resembling what is often supposed to owe its origin to carbonaceous matter abounding in the London atmosphere; but the colour fades on the addition of nitric acid. It cannot therefore be carbon; it is rather the black matter of pigment cells, known to be formed under slight, not under severe, forms of bronchial inflammation. On applying a little heat, and examining this expectoration with the microscope, crystals, apparently of triple phosphate, may be seen. By the politeness of Dr. Garrod, I am able to show you another microscopical preparation of triple phosphate expectorated. It is from a patient in whom a strong impression had been entertained of the existence of phthisis. Dr. Garrod, however, ventured to pronounce the affection bronchial. The progress of the case has established the cor-

rectness of his diagnosis, and serves to confirm an opinion I am inclined to entertain, that the proportion of salts in the expectoration appears to be in an inverse ratio to the degree of inflammation present. Such an opinion is at least in harmony with the interesting observations recorded by Mr. Brett in the 'Transactions of the British Association for the Advancement of Science' in 1837. As an approximation to the proportion of saline matter in the solids expectorated, we may mention from twenty to thirty per cent. in catarrh, from fifteen to twenty in the more opaque mucus of chronic bronchitis, and rather less than ten in the puriform expectoration of advanced phthisis.

Dr. Babington found that the addition of common salt after a time converted pus into a viscid mass like mucus. Dr. Golding Bird perfected the analogy by adding soda to pus, and then transmitting through it a current of carbonic acid. (Guy's Hospital Reports, No. 6.) Chemically speaking, then, the watery, frothy-looking secretion of our first division is chiefly serum; the second, or mucous, is albumen mixed with saline material; the fourth, or purulent, the blood-globules devoid of their colouring-matter, combined with coagulable albumen; and the third, or flocculent, has the mixed character, varying according as the principal proportion of material is supplied by the vomica, or by the bronchial tubes.

It is the third variety of expectoration, however, to which I am specially anxious to direct your attention, because with scarcely any qualification you may regard it as pathognomonic of phthisis. When spat into water you observe it assuming the form of globular masses, like little balls of wool or cotton. Some of these masses have subsided, some are suspended at different depths, others float on the surface, sustained by bubbles of air, entangled in the surrounding mucus. Similar expectoration spat upon the plate has taken the form called by the French nummular, being in flattened, rounded, separate masses, and assuming a shape not unlike pieces of money.

Some of the patients from whom these specimens were obtained are before you. Examine J. E——; you hear in the right subclavicular region two or three distinct clicks accompanying inspiration and expiration. This is humid crepitation, and so good an example of the clicking variety as to give appropriateness to the term of "clicking rhonchus," suggested, I think, by my colleague, Dr. Cotton, as applicable to this conclusive sign of softened tubercle.

E. P—— has distinct indications of vomica, and the cavernous gurgling attending her cough, heard under the left clavicle, accords with the information supplied by the ragged flocculent masses floating in her expectoration.

We have now shown you progressive changes for the worse: let me indicate the reverse alterations characteristic of amelioration.

When the process of contraction is going on in a vomica, a diminished quantity of expectoration is a common and a favourable symptom.

C. V——, a month since, expectorated four ounces daily—now the expectoration has ceased. This result may partly be attributed to improvement of health under the use of appropriate regimen and the ad-

ministration of cod-liver oil, but has probably been promoted by the inhalation of turpentine.

Profuse expectoration into a phthisical cavity is probably a cause as well as an indication of deteriorated blood, and measures which are consistent with a judicious regard to the accompanying conditions, may be advantageously employed in order to lessen its quantity. When the bronchial tubes contribute much to the supply, the skin being moist and the appetite defective, naptha may sometimes be useful, but, generally speaking, tannic acid will probably be found a more appropriate medicine.—*Lancet, August* 2, 1851, *p.* 99.

33.—ON THE USE OF COD-LIVER OIL IN PHTHISIS.

By Dr. Theophilus Thompson, F.R.S., &c.

[Dr. Thompson makes the following remarks upon the virtues of the varieties of cod-liver oil. He says:]

You may wish to form an opinion regarding the comparative efficacy of the different kinds of cod-liver oil. In my early trials of the remedy, six years since, forty or fifty cases were treated with the coarse kind, resembling what is used in preparing leather, and the average benefit derived did not materially differ from that effected by the purest varieties subsequently employed. At a later period I had the curiosity to try these different kinds, combined with liquor potassæ and peppermint oil, giving alternately the coarse and the purified cod oil, and recording the report of the patients; and it is a curious fact that the majority actually gave the preference to the mixtures in which the coarser oil was introduced. Objections have been made to this combination as complicating the treatment with the addition of a medicine by some persons supposed to be inappropriate; but my experience is favourable to the use of liquor potassæ, especially in the early stage of phthisis, and theoretical arguments might be advanced in its favour. In scrofulous affections, if Dr. Hughes Bennett be correct in his hypothesis, there is probably undue acidity of stomach, unfavourable to the solution of albuminous materials. The alkali of the salivary and pancreatic fluids, being neutralized, fails to convert the carbon into oil. The lungs not having enough carbon to excrete, local congestions arise; the blood is overcharged with albumen, and the albuminous exudation being deficient in fat, elementary molecules are not formed so as to constitute nuclei capable of development into cells, and tubercular corpuscles are the natural result.

Cod-liver oil probably tends to obviate the series of derangements just described, by combining with the albuminous element of chyme, so as to form the healthy chyle-granules which feed the blood, and, for the reason above named, is probably better introduced in scrofulous subjects when combined with an alkali. It is a curious fact, that when, about seventy-five years since, cod-liver oil was largely used at the Manchester infirmary, chiefly in the treatment of rheumatism, the medicine was ordinarily given combined with alkali; Dr. Percival's favourite prescrip-

tion being twelve minims of soap lixivium, an ounce of cod-liver oil, and half an ounce of peppermint water. The practice of administering a little lemon-juice afterwards would not necessarily interfere with the action of the alkali, and is worthy of incidental notice in connexion with the recent valuable suggestions of Dr. G. O. Rees in the treatment of rheumatism with the acid of lemons. Occasionally, although not frequently, the stomach rebels against the oil, however purified, and in whatever combination; and I have been accustomed in consequence, under such circumstances, to introduce the oil endermically.

Three years since I was requested to see a gentlemen from the country, confined to his bed, emaciated, hectic, and apparently failing rapidly, with a cavity at the apex of the right lung. There was considerable diarrhœa; and thinking the internal use of cod oil unseasonable, I ordered an ounce, combined with oil of lavender, to be rubbed into the chest night and morning. This gentleman gradually rallied, and returned to the country, where he advanced much in strength and weight, and rode about on horseback. I examined him last year, and, judging from the physical signs, found the size of the cavity materially reduced.

J. S., a patient under my care for the last two years, with softened tubercle in the left lung, notwithstanding the adoption of a tonic regimen, and the internal administration of cod oil, got gradually worse, and in the four months preceding August 1850, her weight was reduced from 105 to 97 pounds. I then prescribed, as a liniment, three ounces of cod oil; an ounce of sal volatile; half a drachm of oil of lavender; five grains of opium; half to be rubbed in night and morning. In a fortnight improvement commenced, and in two months her weight had risen to 104 pounds.

M. A. W., a patient lately in the hospital with cavernous respiration at the summits of both lungs, and who had weekly lost, on an average, a pound in weight for twelve weeks, rallied, gained a little weight during the first month of using the same liniment, and left the hospital somewhat improved. But I will not multiply examples. It is enough to say that satisfactory results have been sufficiently frequent to authorize the measure, sometimes as an auxiliary to the internal use of the oil, but more especially as a substitute when the stomach revolts at its internal administration.

I am indebted to Dr. Glover, of Newcastle, for a reference to some observations of Dr. Klencke, of Braunschwig, confirmatory of the results just described. In a Memoir on the Therapeutical History of Cod-Oil, Dr. Klencke says,—"I shaved some young dogs, and rubbed them with cod-liver oil twice daily for three weeks. At the end of this period they were in as good condition as dogs to whom oil had been internally administered; their bile was found as rich in fat, and their chyle equally charged with corpuscles without nuclei." Klencke adds that similar changes were observed in the bile and chyle of a cat bathed twice a day for some time in the same remedy, and that some oil was discovered in the urine of the animal, proving its free absorption by the skin.

You will naturally ask me whether there are any disadvantages incident to the use of so valuable a remedy? and you may repeat

questions I have occasionally heard: Does it often produce diarrhœa? Does it tend to increase hæmoptysis? As respects the latter question, it might be sufficient to mention that the average frequency of the occurrence of hæmoptysis, as recorded by Louis and other observers, was fully as great in phthisical cases before cod-liver oil was introduced as it has proved in those cases statistically reported at this hospital in which this remedy has been perseveringly used. When hæmoptysis is active, it is, indeed, easy to imagine that a remedy which increases the fulness of the pulse might aggravate the spitting of blood; under such circumstances the fish-oil should be discontinued, and the removal of blood by cupping may be desirable, When, however, as is frequently the case, the hemorrhage is passive, means which tend to enrich the blood are calculated to lesson the hemorrhagic tendency, and its occurrence is by no means an adequate reason for the suspension of the oil.

As respects diarrhœa, a malady which the remedy under consideration has been supposed occasionally to aggravate, my own impression is that no such influence is evinced unless a state of erethism of the mucous membrane is present, in which case measures should be used to obviate such condition prior to the administration of the oil. Many of the patients take the oil unmixed, or, when such combinations are appropriate, floated on nitro-muriatic acid mixture, or on lemon-juice. The addition of creasote occasionally makes the stomach more tolerant of the remedy.

An ounce and a half of cod-liver oil, four drops of creosote, two drachms of compound tragacanth powder, and four ounces and a half of aniseed water, form a suitable mixture, of which an ounce may be taken thrice daily.

Those who take the oil unmixed, may cover the taste by eating dried orange peel, or by introducing a little dinner salt into the mouth before and after the oil.

I believe the fact to be that this medicine has no direct influence on the intestinal action, but that by improving the general health it tends indirectly to restore a natural condition of the bowels, whilst it expands the pulse, lessens the expectoration, moderates the night perspirations, and in many instances supersedes the necessity for the use of any other remedy.

You will say the evidence adduced of the powers of cod-oil is strong but that the remedy was formerly highly estimated and yet fell into disuse, and you may enquire whether it may not exhibit the fluctuations of fashion, and again sink into oblivion. The best way to secure for any remedy its proper place in therapeutics, is to determine its mode of action; and with this view I have from time to time endeavoured to obtain an analysis of the blood of patients who were in the course of improvement under its use: as an example let me show you the analysis of the blood of a phthisical man in the Le Blanc ward, who had gained fourteen pounds weight in three months, and had essentially improved under the cod-oil treatment.

Dr. Snow did me the favour to make the analysis. I place by the side, for comparison, the analysis of the blood of a healthy male, as given by Becquerel and Rodier:—

Analysis of Blood of a Healthy Male.		Of a Phthisical man after three months' Treatment with Cod-oil.
Water	779·0	... 770·6
Blood-globules	141·1	... 143·5
Fibrine	2·2	... 4·0
Albumen ... 69·4	76·2	... 81·5
Extractive & Salts 6·8		
Fatty matters	1·6	.. 0·4

The interest of these analyses is increased by their harmony with the observations of Simon, who recorded an increase of blood corpuscles and diminution of fibrine under the use of cod-oil; and their importance becomes more obvious when they are viewed in reference to the facts stated by Andral and Gavarret, who having analysed the blood in twenty-one cases of phthisis, found their maximum of fibrine, 5·9, their minimum 2·1, and that the amount of corpuscles approximated to the normal standard in only two instances, in which it was represented by 122·1 and 120·4. Frequently, indeed, the amount was below 100, and the decrease of corpuscles was almost always accompanied with a corresponding increase of fibrine. (Simon's "Animal Chemistry," vol. i., p. 281, Sydenham Soc. edit.)

You see that in the patient just referred to, the proportion of blood-corpuscles pretty closely corresponds with that characteristic of health, and Mr. Rodgers reports a similar result from the examination of the blood of some other patients to whom we have given the oil. As far as I am aware, however, chemical observations lead to the conclusion, that in phthisis deficient proportion of blood-corpuscles is the usual peculiarity. Struck with this circumstance, I took pains to collect, chiefly from Simon, analyses of the blood in different diseases, and I have placed before you averages of the proportion of blood-corpuscles and albumen in certain diseases, with a view to compare them with phthisis.

Average Proportion of some Constituents of Blood.

	Albumen.	Corpuscles.
In health	76	... 130
Pneumonia	80	... 122
Phthisis	100	... 78
Rheumatism	100	... 74
Diabetes	105	... 80
Chlorosis	72	... 56
Bright's disease	103	... 50
Carcinoma	45	... 55
Erysipelas	—	... 100

You will observe that there are two diseases which present a peculiar similarity to phthisis, in their proportions of albumen and of corpuscles. These are rheumatism and diabetes. Now it is a remarkable fact, that rheumatism is the malady for the treatment of which cod-liver oil was first introduced into this country, and for which it has been so largely and successfully employed elsewhere. The variety of rheumatism in which it was most effectual is that in which the impoverished condition of blood is most likely to occur.

Dr. Percival, half a century since, (see Works Literary, Moral, and

Medical, by Dr. Thomas Percival, vol. 4, p. 354), observes,—"Men and women advanced in years, whose fibres may be supposed to have acquired a degree of rigidity, find surprising effects from it (cod-oil). Some who have been cripples for many years, and not able to move from their seats, have after a few week's use of it been able to go with the assistance of a stick, and, by a longer continuance, have enjoyed the pleasing satisfaction of being restored to the natural use of their limbs, which for a long time before had been a burden to them. Two cases occurred lately in which the oil had an extraordinary effect, even on young persons, whose ages did not exceed ten years. Guaiacum, calomel, blisters, &c., were tried on both these patients, but with so little benefit that opiates were given merely to procure temporary relief. Their lower limbs seemed to be a burden to them, and they had such an appearance of distortion, that no hopes of relief could be well entertained. In compliance of the particular request of their parents, the cod-oil was given. The one obtained a perfect cure, the other nearly so; the latter having a little distortion in his back, is prevented the use of his legs. So general (adds Dr. Percival) has been the use of the oil with us, that we dispense fifty or sixty gallons annually; and the good effects of it are so well known amongst the poorer sort, that it is particularly requested by them for almost every lameness. Except bark, opium, and mercury, I believe no medicine in the materia medica is likely to be of more service, and I should wish for a more general use of it, in order to prove that the above account of its good effects is no exaggeration."

I am strongly impressed with the value of the remedy in diabetes. It is true that this disease involves an additional element, which it is not easy to suppose amenable to such a remedy as fish-oils, but the benefit derived in many respects is often remarkable.

In the month of April, 1848, a patient came under my care who had been affected with diabetes for some months, and had taken creosote and other medicines with little advantage. At the time I first saw her the quantity of urine passed in twenty-four hours amounted to ten pints.

The following table will show the progress under the cod-liver oil treatment:—

Dates.	Remedies.	Urine.	
		Quantity.	Specific Gravity
1848			
April 1	Cod-oil, two drachms three times a day.	Ten pints.	
,, 13	Ditto.	Six pints.	
,, 20	Ditto.	Four pints.	1·040
,, 27	Cod-oil, four times daily.	Six pints.	1·042
May 4	,, five times daily.	Three pints.	1·042
,, 11	Ditto.	Three pints.	1·037
,, 18	Ditto.	Two pints and qr.	1·020

Subsequently this patient passed unavoidably into other care, and owing to a misunderstanding, did not resume the cod-liver oil, which had been from temporary causes, intermitted. She took a variety of remedies, including sulphur, hydrochloric acid, opium and alkalies. drachm doses of carbonate of soda for a time acted favourably, but on the whole she retrograded. Her weight, which in June, 1848, was 107 pounds, had fallen, by December, 1849, to 88 pounds. Her appearance was haggard; and there was threatening of pulmonary disease. The cod-oil was resumed, and even then with temporary advantage, but she ultimately relapsed and sank.

The theory which I have now proposed in explanation of one mode of action of the oil is in harmony with the fact that its good effects are specially produced in women and children, for in them the relative proportion of corpuscles is stated by chemists to be small.

I may state that the remedy has afforded me most satisfactory results in neuralgia and sciatica, when associated with anæmia. Whenever arterial or venous murmurs indicate such a condition, a rapid improvement may be expected to follow the administration of the oil, even without the assistance of ferruginous medicines. In some disturbed manifestations of the nervous system which may appear more moral than physical, the presence of a weak, small pulse, has sometimes led me to give the oil, and with signal success. Do not think that I dwell on this subject from any love of fanciful hypothesis. When the light issuing from a certain number of facts seems to converge towards a particular point of explanation, it is useful to try the applicability of that explanation to analogous facts, and thus to entertain, I do not say to adopt, a theory—a sort of tentative theory, or "*prudens quæstio.*" If the theory prove universally applicable, we obtain a law; if the explanation be found incorrect, it is yet seldom fruitless: indeed the proof of its inadequacy serves to narrow the field of enquiry, and to increase the probability that the next step may be in the right direction towards the attainment of truth. Time is sometimes lost in the laborious accumulation of miscellaneous facts. Numerism is productive only by the amount of "*lumen siccum,*" intellectual intuition,—applied in the selection and appreciation of facts. There is an aristocracy in facts as well as races, and the mind should be taught to discern their prerogative dignity. "The naturalist who cannot or will not see that one fact is often worth a thousand, as including them all in itself, and that it first makes all the others facts —who has not the head to comprehend, the soul to reverence a central experiment or observation, (what the Greeks would perhaps have called a protophænomenon), will never receive an auspicious answer from the oracle of Nature"

To apply these observations to our immediate subject, let me remark that changes produced on the blood by diseases or remedies may fairly be placed amongst cardinal facts. It can scarcely be doubted, that if a professor accomplished in chemistry were officially connected with every hospital, such facts might be so collected as to render the discoveries of this important science available, in a remarkable degree, for the advancement of practical medicine.

Should further observation confirm what has been suggested in this lecture regarding the influence of fish oils on the composition of the circulating fluid, we shall discover more than the reason of their usefulness in phthisis; we shall show that they have no exclusive adaptation to that disease, but that they may be given with equal promise in various diseases associated with analogous conditions of the blood: and thus we may come to establish a therapeutical law so widely applicable as to simplify our principles, extend our resources, and consolidate our system of practical medicine. Such a generalization would commend itself to my mind by its freedom from complication and obscurity; for I am sure you will agree with me as to the evidence afforded in the noblest triumphs of philosophy, that although shallowness and obscurity are continually associated, yet that the ocean of truth is clear as well as deep, and that in proportion as we approach the truth, we shall attain to simplicity.—*Lancet, Sept.* 13, 1851, *p.* 243.

34.—ON CHLOROFORM IN PULMONARY CONSUMPTION.

By T. Spencer Wells, Esq., Surgeon, R.N.

[Mr. Wells relates the following case at the request of a recently deceased nobleman, who had suffered during the last eight months of his life from attacks of difficult breathing and spasmodic cough. Most of the favourite remedies were employed with no relief to the symptoms, indeed, in some cases, with positive harm. Mr. Wells proceeds:]

At Rome, in May, the violence of the cough was quite extraordinary, and the fits of difficult breathing resembled those of pure spasmodic asthma. I was called to him in one of these fits just after having employed chloroform for another purpose. The thought then occurred simultaneously to his lady and to myself, to attempt, at any cost, to give some temporary relief. I accordingly threw a few drops of chloroform on a handkerchief and held it before his face. The most complete relief was afforded immediately. In a few seconds, he passed from a state of extreme suffering to one of perfect ease. Tolerably healthy respiratory murmur was heard in parts of the chest where loud cooing and whistling noises had been heard just before. From this time he would never be without chloroform in his room. He thought once or twice that it left a feeling of faintness, or increased weakness for some hours, and, at one time, slight coldness and want of circulation in the extremities followed it; but I am not at all sure that these were not mere coincidences. They led me, however, to use the chloroform in a dilute form, mixing it with from four to six parts of eau de cologne. About half a drachm of this mixture on a handkerchief quite sufficed to afford relief, and, as he did not take it at first more than three or four times a week, the quantity of chloroform inhaled was then very small; yet it always enabled him *immediately* to take a long, full, deep breath, and he described the sensation of relief as "most luxurious." Latterly, as advancing disease led to a more frequent necessity for its employment, I thought the spirit

in the eau de cologne might affect his head. I therefore gave the chloroform pure. Afterwards, the "dead feeling" in the limbs and increased weakness was never observed, although the quantity of chloroform inhaled was much greater. He never took it, however, in such a quantity as to produce anything like insensibility. He was always perfectly conscious, and knew the exact moment when the necessary relief was obtained. If he continued the inhalation longer, he felt himself becoming a "little light about the head," and sometimes spoke for a few moments in a confused manner; but I never observed, at any time, the least ill effect which could fairly be attributed to the chloroform. The pulse always became fuller and softer, but its rate was scarcely, if at all, affected.

During the last few days of his life, those well-known symptoms of ulceration of the trachea came on, which often render the termination of consumption so agonising both to the patient and his friends. They led to the more frequent and almost constant use of chloroform, but in the same small doses, and with the same happy results. The intellect remained perfectly clear until asphyxia was actually commencing, and he was most anxious that those suffering from his disease might find relief from the same remedy. He called it his "bottle of life." He was well acquanted with the physiology of respiration and circulation, was continually analysing his own sensations, and he said he felt perfectly sure, not only that the chloroform relieved some spasmodic closure of the air-passages, and allowed air to enter his lungs, but that the vapour itself "ventilated his blood" more than common air would do. Its effect was always certain and immediate. We never had to *hope* that the remedy would be effectual; we were always *certain* that, whatever the degree of dyspnœa, however great the violence of the cough, so long as we had chloroform, the means of relief were at hand, and we were never once disappointed.

I do not wish to add any speculations to a narrative which I intend as a plain statement of facts, still less to deduce any general conclusions from one case; but I may add, that I have employed chloroform in two cases of spasmodic asthma with similar good effects, and that I have never been able to trace the least ill effect to its use. Even if it were proved to produce such injurious effects as opium and other narcotics, I submit that this would be no valid objection to its employment, for the daily general use of these drugs, the benefit of which is often very doubtful, shows that such ill effects are universally thought to be less than those likely to result from unrelieved cough and dyspnœa. I had more than one proof during the progress of the case just related, of the truth of the general belief, when, owing to accidental circumstances, no chloroform could be procured for some time. It must be remembered, also, that the period during which phthisis was running its course was much more than double the average length.—*Med. Times, October* 11, 1851, *p.* 376.

35.—SPECIMEN OF LUNGS SHOWING THE ARREST OF PHTHISIS IN THE THIRD STAGE OF THE DISEASE.

By Dr. Quain.

[The following case was brought by Dr. Quain before the Pathological Society of London.]

A female, in May, 1848, when thirteen years of age, was admitted an out-patient at the Brompton Hospital. She was very delicate, had lost flesh, and was suffering from severe cough, shortness of breathing, &c. Her illness had commenced with influenza in the early part of the preceding winter; she had also suffered from an abscess in the right arm. She had been recommended cod-liver oil, but was unable to keep it on her stomach. There was no predisposition to phthisis, and she had not then had hæmoptysis. Since that time a younger sister has shown unequivocal evidence of phthisis, and an older sister has now become delicate. A note, taken shortly after her admission, states that "there is extensive consolidation at the apex of the left lung, and some deposition at the apex of the right," shown at the one side "by decided dulness, bronchial breathing, and bronchophony; and at the other side, by a feeble inspiratory, and a prolonged louder expiratory murmur."

A mixture, in which a drachm dose of cod-liver oil was diffused by means of liquor potassæ in mucilage, and a syrup composed of mucilage, syrup of squills, and a minute dose of morphia, was prescribed. The oil mixture was taken without disturbing the stomach, and she kept her ground. Examined in August she is stated to have lost four pounds in weight, and crepitation is heard over the left apex; nothing additional at the right apex. Iodine counter irritation was then applied. In the beginning of September she had profuse hæmoptysis, and subsequently a free puriform expectoration.

An examination, made in the course of this month, when she was able to attend the hospital, showed the existence of a large cavity, where the consolidation and softening had been previously observed. The dose of the oil was subsequently increased, first to a drachm and a half, and then to two drachms, with advantage; for in the end of the following December, it is recorded that "she gains strength, and coughs but little." She did not attend during this winter, but received her medicine by her mother, and did well. In April, 1849, she had an attack of influenza, from which she soon rallied.

In the following June the record is, that "she has not lost ground, though she had not gained in weight since her admission a year ago: there is loud pectoriloquy, cavernous breathing, and gurgling at the left apex, and loud expiratory murmur at the right."

At the end of July the report is "she looks well, coughs only in the morning." In August an examination showed "flattening of the chest over the apex of the left lung. The respiration there, though cavernous, is not loud. The pectoriloquy is very distinct. The respiration at the right apex is somewhat peurile." During the winter (1849-50) she continued the remedies.

In February her appetite had failed, and a mixture of infusion of gentian and bicarbonate of soda was ordered once a day. From this

she derived so much benefit that it was continued three times daily, and she was able to take the simple aniseed oil in half-ounce doses.

The following June it is noticed that she has had an attack of nettle-rash, but is still gaining strength, grows tall, and coughs but little, and only in the morning.

This improvement continued; and it is noted that last October she came to the hospital, having been for some time in the country, looking extremely well. Her weight which at one time had been as low as four stone two pounds, is now four stone nine pounds. She had scarcely any cough; her appetite is good. She is free from suffering of any kind. Examination of the chest shows remarkable flattening and contraction over the apex of the left lung. There is very evident dulness in this situation, and the mobility here is as 9 to 32 of the opposite side. The respiration is of a sharp whiffling character, with slight crepitus. At the opposite side the respiration is loudly peurile, and percussion shows the right lung extending across the sternum to the left side. At the summit of the left lung posteriorly the respiration is scarcely audible. The dulness here is more decided than in front. The heart is seen and felt to beat distinctly from between the second to the fourth left costal cartilages. The action of the heart in this situation had been a source of some annoyance to her. From this time (Octber) to the commencement of last March, this improvement continued. Her cough had nearly if not altogether disappeared. She continued the gentian with soda, the cod-liver oil, and the counter irritant occasionally. At the beginning of March, during the prevalence of the influenza, she was attacked by the gastric, and not the pulmonary, complication of the disease. It commenced with bilious vomiting, followed by diarrhœa, great prostration and rapid collapse, from which she died on the fourth day.

The body was well proportioned, and showing a very fair amount of fat in the subcutaneous tissue. The right lung was seen to be very voluminous, and extending across nearly as far as the left margin of the sternum. There was no appearance of the left lung in front, but its place was occupied by the heart and pericardium drawn upwards and to the left side, and the walls of the apex of the chest falling inwards and downwards. The heart was healthy, and rather large for the size of the body. The left lung was found much diminished in size behind it The lung was adherent more especially at the apex, which was covered posteriorly by a mass of solid fibrinous tissue, corresponding to the seat of dulness and feeble respiration previously mentioned. Very nearly the whole of what had been the upper lobe of this lung was occupied by the remains of a cavity irregularly divided into two by one of the bands so frequently seen in phthisical cavities. The entire cavity was about the size of a large walnut. It contained about half a drachm of a thin whey-like fluid, with which were mixed particles of whitish coagula. The walls were formed by condensed pulmonary tissue, varying in thickness from less than a line to a quaater of an inch, and in some points puckered and contracted. The air-cells and small bronchi were distinctly visible, under the microscope, in this tissue, which was separated from the contents of the cavity by a wall or membrane composed of firm filamentous tissue and granular cells. This membrane had much

the appearance of a mucous membrane, but it was not examined sufficiently soon after death to be able to trace the presence of an epithelium. The cavity communicated with the left bronchus by an orifice which would admit a crow-quill, situated midway between the top and bottom of the cavity. There was a good deal of healthy respiratory tissue in the lower lobe of this lung; but there were scattered through its substance six or seven points of condensation, such as are hereafter described existing in the right lung. The right lung was large, and the air-cells partook of its character. In water it displaced a quantity which measured twenty-three ounces, whilst the left displaced but nine ounces. The apex was remarkably puckered; and on cutting through this puckering the tissue of the lung was found to be traversed by short fibrous bands, between which appeared points of softish pale yellow tubercle. A little lower down in the centre of the upper lobe a mass of soft tubercle, about the size of a small hazel-nut, was found. It was enclosed in a cyst, and consisted almost entirely of fatty granules and cells containing similar particles. In the other lobes several consolidated points were found—the largest smaller than last described, and none so fully formed. They appeared in some places to consist merely of condensed tissue; in two there was an appearance of yellow, firm tubercle, and in two, small calcareous particles. In neither lung was there the least appearance of recent tuberculous deposit. The other organs were healthy: the kidneys were large. There was no disease of the intestine beyond congestion, which in some parts was very distinct.

This case affords an additional illustration of the great extent to which the ravages of pulmonary phthisis may proceed, and its progress yet be stayed. Such cases were, happily, now met with more often since cod-liver oil had come into use: still Dr. Quain did not know of any case which afforded, by the evidence of post-mortem examination, so striking a result. This case was also interesting from its throwing light on the nature of the puckerings so constantly seen. Some observers were disposed to regard them as being independent of tuberculous deposit. In this case it was evident that they were due to the previous existence of this deposit, which, in fact, had been recognised there during life, and traced after death.—*Med. Gazette, June* 20, 1851, *p.* 1086.

36.—ON THE PATHOLOGICAL STATES OF THE LUNG CONNECTED WITH BRONCHITIS AND BRONCHIAL OBSTRUCTION.

By Dr. W. T. Gairdner, Pathologist to the Royal Infirmary of Edinburgh.

[In discussing the relation of bronchitic collapse to pulmonary emphysema Dr. Gairdner suggests that what he calls the deobstruent function of the bronchial tubes must be of the greatest physiological interest, reflecting that there is scarcely a fever, or other debilitating disease, in which the signs of mucous accumulation and of partial pulmonary collapse may not at one period or other be discovered at the lower and

back part of the lungs. Dr. Gairdner also believes, that even in health the removal of the viscid secretion constantly formed in the tubes must form an element of the highest importance in their function. In some persons this removal seems to be ill-performed, though in greater quantity than natural; it is not discharged as rapidly as it is secreted, either the deobstruent apparatus being defective, or from the bronchial muscles being innervated. These persons are subject to the dry or humid asthma of English authors, and of the catarrh sec. of Laennec, and they are liable to the supervention of organic disorder, usually a form of pulmonary emphysema, especially if care is not taken to guard against the occurrence of bronchitis.]

Not unfrequently a considerable, or even an extreme amount of pulmonary emphysema is observed to follow a single attack of acute disease in the chest. Thus emphysema frequently arises in the earliest years of infancy and childhood, as the consequence of some form of severe infantile bronchitis; and all practitioners can bear witness to many cases in which shortness of breath and incapacity for exertion can be traced distinctly back to the date of an attack of hooping-cough or measles. Some of the most marked instances of emphysematous lungs in young subjects that have fallen under my notice, in dissection, have had a similar history; and all authors on the diseases of children, who have carefully investigated the morbid anatomy and history of these affections concur on this point. Again, in adults otherwise healthy, the severer forms of epidemic influenza are peculiarly apt to be attended with, or followed by, the development of emphysematous lesions; a fact which has been well observed and carefully recorded by Dr. Peacock, in his excellent history of the last London epidemic of that disease.

Finally, a certain amount of emphysema of the lungs is of so frequent occurrence in the aged, as to be scarcely entitled to the name of a disease, distinct from the other evidences of corporeal decay. This fact was first pointed out by Magendie, and the form of emphysema here alluded to has since been described by many pathologists as a peculiar one, constituting a kind of senile atrophy of the pulmonary tissue. But there can be little doubt, that here also the pulmonary lesion is the concomitant of a bronchial affection,—the chronic bronchitis or bronchorrhœa,—which is the almost constant companion of the more advanced periods of human life. In cases where this has been absent, I have repeatedly found the lungs of very aged individuals free from all trace of emphysematous lesion.

Considerations like these have, ever since the accurate descriptions of emphysema by Laennec became generally known, given rise to a general belief among practitioners that emphysema is related to bronchitis as effect to cause; and that it is indeed the organic lesion of the lung of all others most closely and invariably connected with long-continued or severe bronchial affections.

Mechanism of emphysema.—Emphysema of the lungs was said by Laennec, in one of the most original and accurate of his descriptions, to have two varieties: the one being a dilatation of the air-cells, and finally a rupture of them one into another by removal of their septa; the other a rupture of the air-passages directly into the interlobular

areolar tissue. It is needless to repeat these descriptions, the distinction of vesicular and interlobular emphysema being well known to every one, or at least accessible to all, in words which cannot be improved. It is only necessary to add, that the microscope and other modern means of investigation, which have done so much for morbid anatomy, have scarcely availed here to augment our knowledge; having only succeeded in demonstrating more clearly the fact, known to Laennec, of the gradual breaking up of the vesicular septa, and the obliteration of their capillary network.

Emphysema, therefore, is an abnormal distension of the pulmonary tissue with air. In its earliest stages, whether interlobular or vesicular, or, as frequently happens, both combined, nothing can be more certain than that it is essentially a mechanical lesion: in fact, the distension of the air-cells, giving the peculiar cushion-like and pale appearance to the lung, can be exactly imitated by inflating it with undue force artificially. Moreover, the whole of the subsequent structural changes implied in the gradual removal of the septa and obliteration of the capillaries, are readily explained by the mechanical effects of distension. Upon this subject M. Poiseuille, to whom we owe so many interesting facts in mechanical physiology, has a very beautiful experiment.

An instrument being adapted to the pulmonary artery of an animal, by which a given quantity of liquid was propelled with a given force through the capillaries of the lung, he found that this was effected, in the normal condition, in 29 seconds. M. Poiseuille now inflated the lungs so as exactly to fill the cavity of the chest; the time was still 29 seconds. On distending the lungs, however, farther, so as to produce the appearance of a partial emphysema, the time required for the passage of the fluid became lengthened to 62 seconds; when the emphysematous appearance was increased, 95 seconds; when it pervaded the whole lung in consequence of excessive distention, 129 seconds were required, and the fluid returned from the pulmonary veins mixed with some bubbles of air. From these results, it is evident that whenever the air-cells are distended beyond the amount required or possible in the healthy condition, the flow of blood through the ultimate capillaries of the lung must be retarded or obstructed;—a condition not only corresponding with the appearances observed in emphysema, but readily accounting for the structural changes, the absorption of the walls of the air-cells, and the tension and obliteration of vessels observed in the latter stages of the disease.

It is, therefore, nearly certain that the source of emphysema is to be sought in a derangement of the mechanism of respiration, and not in any previously morbid condition of the affected part. Every thing denotes that the emphysematous parts of a lung are usually free from all diseased changes, with the exception of those which are the result of inordinate distension. The freedom from œdema and from morbid deposits, when other parts of the lung are so affected; the absence of accumulation in the bronchi, or at least its comparatively slight character, allowing of the perfect and easy inflation of the emphysematous parts when others are collapsed; finally, the habitual seat of emphysema in those parts of the lung which are usually most exempt from other dis-

ease,—all tend to prove what I have now stated. The diminished elasticity, the dryness, the anæmia, which have all of them been supposed to be the predisposing cause of this lesion, are manifestly nothing more than the effects of the distension with air upon the circulation and nutrition of the compressed walls of the delicate pulmonary air-cells. Even the small accumulations of granular deposit found by Mr. Rainey may be accounted for by these secondary nutritive changes.

But emphysema is not merely a lesion resulting from inordinate distension of previously sound portions of lung; it is, as we have already seen, the product of mechanical derangement in the *sound parts* of lungs *otherwise diseased.* The existence of bronchitic condensation, of induration, of concretions, &c., if not a necessary cause of the production of emphysema in the sound air-vesicles, is at least in some way related to it.

[Some suppose, as Laennec, that emphysema is produced by violent efforts of coughing or other forcible expiratory acts; believing that it occurs in the act of expiration. But the expiratory act is mechanically incapable of producing distension of the lung, or any part of it, and it is singular that a theory so radically unsound, and devoid of proof, should have been allowed to maintain its place in medical science. Dr. Gairdner continues,]

It appears to me that none of the writers on this subject have clearly apprehended, or at least clearly expressed, the single obvious condition which is necessary to the mechanical completeness of the inspiration-theory of emphysema. Emphysema is, according to this theory, a *complementary* lesion, dependent upon the previous existence of some form of occlusion of the vesicles, and invading the remaining sound portions of lung. Thus far it corresponds with all that we have hitherto seen, to an extent certainly not anticipated by Dr. Williams, when, after enunciating his own view, he brings forward Laennec's theory to account for residual unexplained cases. But there is yet another condition necessary, besides mere occlusion of the air-vesicles in a part of the lung: this is *partially diminished bulk;*—in other words, collapse or permanent atrophy of a portion of the lung.

I am prepared to maintain, that emphysema of the lung may, in all cases which I have witnessed, be satisfactorily accounted for by considering it as *a secondary mechanical lesion, dependent on some condition of the respiratory apparatus leading to partially diminished bulk of the pulmonary tissue, and consequently disturbing the balance of air in inspiration.* I, therefore, submit this principle to the judgment of the profession, in the confident anticipation, that it will prove no less constant and satisfactory in the hands of other observers, and will establish itself as the exclusive law of the production of this most important lesion. —*Monthly Journal of Med. Science. July*, 1851, *p.* 2.

37.—*Bleeding in Pneumonia.*—By Professor Bennett, (from his Clinical Reports.) –I have on a former occasion pointed out the rule which, it appears to me, should guide you with regard to bleeding in pneumonia. If you are called to a case at a very early period before

exudation is poured out, and before dulness as its physical sign is characterised, but when, notwithstanding, there have been rigors, embarrassment of respiration, more or less pain in the side, and commencing crepitation, then bleeding will often cut the disease short. This state of matters is rarely seen in public hospitals. When on the other hand, there is perfect dulness over the lung, increased vocal resonance, and rusty sputum, then exudation blocks up the air-cells, and can only be got rid of by that exudation being transformed into pus, and excreted by the natural passages. In such a case, bleeding checks the vital powers necessary for these transformations, and as a general rule, if the disease be not fatal, will delay the recovery. I believe this to be the cause of so much mortality from pneumonia in hospitals where bleeding is largely practised, for in general, individuals affected do not enter until the third or fourth day, when the lung is already hepatized.—*Monthly Journal of Med. Science, August* 1851, *p.* 159.

38.—ON A CASE OF THYMIC ASTHMA.

By Dr. John Armstrong, Gravesend.

[On the 29th of January, 1851, Mrs. M., residing in London, was sent to Gravesend with her child, aged five months, for change of air. A short time afterwards, Dr. Armstrong was sent for, in consequence of the child being seized with something like a fit. Three weeks before the child was suddenly seized with great difficulty of breathing, while out of doors—becoming almost livid in his countenance, and seeming as if he would be strangled before he could get his breath; on the present occasion there had been some slight 'crowing.' A few weeks after, the child had a similar attack, apparently brought on by cold.]

The child was attacked with symptoms of catarrh, which were slight, and were not considered to require medical attendance. After a few days (April 12th) he experienced another and more severe seizure than any former one, and I was sent for in great haste. The history given was the following;—The child became suddenly dark about his mouth, held his breath, his eyes seemed starting from their sockets, and his limbs became violently stretched. He appeared to recover his breath, began to cough, and when I arrived the attack had passed away. He looked frightened; his face pale and bathed in perspiration; pulse weak, intermitting, and quickened; skin cold. There was considerable fulness of the veins of the neck; the chest resonant throughout; sibilus and ronchi heard over the left lung, and partly over the right; most distinctly heard on each side of the dorsal spine.

That night I was summoned to the little sufferer, who was stated to be dying. The attack was much the same: he had been sleeping, awoke up, become livid, convulsed, and apparently gasping for breath. I found him pale, with his head and face bathed in perspiration, with a feeble intermittent pulse, a loose frequent cough, troublesome at the termination of the attack. There had been no crowing respiration. The attacks of dyspnœa now became frequent; he rarely went to sleep without an

attack on awaking. They were now invariably accompanied with convulsions of an epileptic character. The countenance during the attack, lips especially, were quite livid, the tongue protruded, eyes turned in towards the nose, and nearly constant carpo-pedal contractions. The sides and centre of the lower part of the throat swollen, the jugular veins much distended; and the respiratory murmur was harsh or indistinct at the posterior part of the thorax. As each convulsive attack subsided, there was a peculiar, harsh, incessant, convulsive cough, by which small portions of frothy whitish phlegm were expelled from the trachea; and after some time about a teaspoonful or two was discharged, and the child seemed relieved. The difficulty of swallowing, especially of semi-fluid substances, continued, appearing always to excite coughing. Nothing gave relief; he continued to get worse, and died after an attack on April 24th, about a fortnight after the catarrhal seizure.

Post-mortem examination sixteen hours after death.—In the examination of the body, the chest chiefly attracted attention. There was a large thymus gland, extending from the thyroid gland to the pericardium, and laterally filling the space between the trachea, clavicle, and first rib. It was dense, firm, lobulated, of a fleshy colour; contained no fluid; it was upwards of an ounce in weight; its greatest density and development appeared on the left side; the large veins appeared almost flattened by the pressure; the par vagum and recurrent were pushed aside from their usual course, and must have been much pressed. The heart was of ordinary size, nearly empty. The foramen ovale closed. Internally the larynx and trachea were pale, except at the part where the thymus pressed, which was reddened; the remainder was natural; and without inflammatory appearances. The lungs, anteriorly, were natural; posteriorly, extensively carnified. Abdominal viscera healthy. The head was not examined.

Remarks.—This is the second case of this form of "laryngismus stridulus" which has occurred in my practice after a tolerably extensive acquaintance with infantile diseases for twenty years. The other was so similar in the essential characters both of the symptoms and post-mortem appearances, that after the above lengthened detail, I feel it is unnecessary to give them.

It is obvious that I do not class the ordinary cases of laryngismus stridulus, as Good has termed it, with the form under consideration. I have generally to treat cases of that form every year, which have been sent from London for change of air, (for I may, in passing, observe, that among the children of this healthy locality, the disease is almost unknown). The London children soon recover under the influence of fresh air, and such treatment as the case indicates. But the variety which Kopp has called thymic asthma, is a much more formidable affair. I am aware that there is great difference of opinion respecting the disease, some even denying that the enlarged thymus is the cause of such alarming symptoms, but the careful, truthful observations of so many persons must carry conviction to unprejudiced minds.

To Mr. Hood of Kilmarnock, we are indebted for the first clear account of this formidable complaint, although Hassé, in his 'Pathological Anatomy,' says, "That Kopp first attempted to connect this

preternatural enlargement of the thymus gland, and its pressure on the trachea, with an alarming ailment peculiar to childhood, which he accordingly termed thymic asthma" One cannot help feeling surprised at this error, as Hassé is obviously pretty well acquainted with English medical literature, and Kopp himself, in his Essay, adverts to Hood's paper. In addition to the papers and cases by these gentlemen, we have some by Drs. Copland, Montgomery, and West. This latter gentleman has observed one case, narrated in his very admirable "Lectures on the Diseases of Children," and which corresponds very exactly with the two cases observed by myself.

The conclusion is unavoidable, that though this form of the disease is very rare, yet that a most formidable and fatal disease is occasionally met with, dependent on enlarged thymus gland. That many of the symptoms exist in common with the ordinary forms of "laryngismus" is unquestionable, and therefore laryngismus stridulus must be considered as a generic term including several species. And, no doubt, by looking at the subject in this light, the discrepant opinions on this disease can be reconciled.

The disease presents itself under three forms:—

First. It occurs as a consequence of teething, intestinal irritation, worms, eruptions about the head, or it may be of a nervous or spasmodic character; and by suitable treatment—especially change of air—is generally cured. Mr. Robertson of Manchester, in the 'Medical Gazette, vol. viii,' new series, has very clearly shown the benefit of change of air, and I fully agree with him; but we must not be misled by supposing that change of air is all that is requisite; so long as there are sources of irritation, the disease will probably go on till they are removed. I have been frequently consulted under such circumstances, and cases which had come here for change of air remained "in statu quo;" but as soon as the disordered function was rectified, the disease began to subside, and finally ceased. I could enumerate many cases of that description.

Second. The next class of cases are those which the late Dr. Hugh Ley so admirably portrayed; but although he threw much light on the subject, yet his views, it must be admitted, were too limited. He attributed these affections to enlarged bronchial and thyroid glands. Doubtless there are cases of this description—and bad cases they generally are—but I believe they do not occur so frequently as Dr. Ley supposed. Change of air, a healthy nurse, or suitable diet, close attention to the gums and bowels, and the administration of syrup of iodide of iron, will constitute the chief remedies.

Third. The last, most rare, and as I believe, the most formidable class, are those which have formed the subject of this paper, and the treatment of which is by no means settled. The first case I had was seen by my partner, the late Mr. Park, of this town, and he took the views entertained by Dr. John Clark as to the treatment. Accordingly, leeches and blisters were applied to the head, and mercury was given freely; but the post-mortem examination gave no signs of head disease, and nought save the hardened, enlarged thymus was discovered to explain the distressing symptoms. Mrs. M——'s child was treated by constant attention to the gums and bowels, leeches and blisters in the

region of the thymus, mercury and anti-spasmodics, but with scarcely any relief. My impression is, that occasional leeching on the upper part of the chest, with the application of iodine externally and internally; strict attention to every source of irritation, with a view to its immediate removal; *causing the child to lie with its head well raised during sleep:* a healthy atmosphere, and light food, will constitute the treatment most likely to prove beneficial.

But although I cannot point out any infallible mode of treatment, a few words on diagnosis may prove beneficial.

Dr. Copland, in his 'Dictionary,' says truly, "The diagnosis of enlarged thymus gland is a matter of importance, but of difficulty," and has ably pointed out the leading distinguishing features.

Those upon which I would place most reliance are, the sex of the child (males constitute by far the majority of those already reported); the pale, white, soft countenance; the permanent fulness about the upper part of the sternum, extending upwards nearly to the thyroidal region; an almost constant fulness of the veins of the neck, particularly after any effort, and very strongly evident for some time after an attack of dyspnœa; dulness on percussion over that part of the sternum; signs of congestion of the lungs, and from an early period difficulty of swallowing; the crowing sound is either entirely absent or very partial; the pulse is weak and intermittent; and there are copious perspirations over the head. These constitute a group of signs which enable me to determine my case most clearly, and I have no doubt will afford unerring guidance to those who have never met the disease, in arriving at a correct diagnosis when any such arise in their practice.—*Lancet, July* 12, 1851, *p.* 28.

39.—ON THE CIRCUMSTANCES MODIFYING THE AMOUNT OF OXYGEN GAS CONSUMED AND CARBONIC ACID GAS EVOLVED IN THE FUNCTION OF RESPIRATION.

By Dr. William Prout, F.R.S., &c.

[By a series of many hundred experiments upon himself, Dr. Prout has established the two following laws.]

Law I. The amount of oxygen gas consumed, and, consequently, of carbonic acid gas formed during respiration, is not uniformly the same during the twenty-four hours, but is always greater at one and the same part of the day than at any other; that is to say, its maximum occurs between the hours of 10 a.m. and 2 p.m., or generally between 11 a.m. and 1 p.m.; and its minimum commences about 8 h. 30 m., p.m., and continues nearly uniform till about 3 h. 30 m., a.m.

Law II. Whenever the quantity of oxygen gas consumed, and consequently of carbonic acid gas formed, has been by any cause increased or raised above the natural standard of the period, it is subsequently as much decreased or depressed below that standard, and *vice versa.*

The first law is subject to some variations, but Dr. Prout never observed that it was liable to any exception. In all his experiments it

was constantly observed, that a greater quantity of carbonic acid gas was given off in the middle of the day than at any other period of the nycthemeral space. In general the degree and order of these variations are the following.

The quantity of carbonic acid gas which remains stationary at 3·30 per cent., the minimum during the night, begins about 3·30 a.m., suddenly to increase, at first slowly, afterwards more rapidly till about noon, when it is usually as high as 4·10 per cent., its maximum. After this time it begins to sink, at first quickly, then more slowly, till about 8·30 p.m., when it again attains the minimum rate, 3·30.

From the peculiar order and time at which these oscillations take place, Dr. Prout offers the conjecture, that these variations may depend on the presence and absence of the sun. He admits, however, that the question must be decided by subsequent observations. All that can be said is, that certainly the presence of the sun and solar light have very great influence upon the functions both of plants and of animals; and it is quite in accordance with many observations to think, that the decarbonizing power of the lungs may be most energetic while the sun is above the horizon, and the influence of light and heat is greatest.

Dr. Prout further found that the first law was liable to variations,

1st. In the quantity of carbonic acid gas as given off by the same individual in different days; and

2d. In its quantity, as given off by different individuals.

As to the first, Dr. Prout observed the variations several times; and was led to infer that when the increase is considerable it depends upon an electrical state of the atmosphere. Depressions or diminutions, he occasionally traced to abstinence in the use of food.

As to the second form of variation he found that the quantity of oxygen gas consumed, and consequently of carbonic acid gas, formed in a given time, by different individuals is very different. The lowest is that by himself or 3·45 cubic inches; the next is the estimate by Sir Humphrey Davy, from 3·5 to 4·5 cubic inches; and the next is by a friend of Dr. Prout, under precisely the same circumstances, and about the same age, namely, thirty years, both being of regular habits and in perfect health.

The circumstances under which the quantity of carbonic acid gas is increased appear to be comparatively few. Those under which it is diminished are very numerous, and the effect of the latter are both greater and more permanent.

Exercise, if not long continued and carried to fatigue, increases the amount. When long continued so as to fatigue, the amount is diminished. The same effect is produced under the operation of the exhilarating passions.

As to food, long abstinence diminishes the quantity of carbonic acid gas eliminated; yet not to so great a degree as might be expected.

The following observations on the effects of the use of spirituous and fermented liquors are important in showing, how these agents impede the proper functions of the lungs in eliminating carbonaceous matter from the system. Alcohol and all liquors containing it which were tried, diminish the amount eliminated, much more than any other article

or circumstance subjected to experiment. Under the use of porter, even the amount diminished is reduced below the standard; while the reverse was the case when water only is taken. The experiments made on this subject furnished results which fully convinced Dr. Prout, that the use of alcohol in every state and in every quantity uniformly lessens in a greater or less degree the quantity of carbonic acid gas eliminated, according to the quantity and the circumstances under which it is taken. When alcohol, either pure or diluted, is taken upon an empty stomach its effects are remarkable. These effects appear to take place almost instaneously; and the depression in the amount of carbonic acid gas extricated is the greatest. After a short time, however, the powers of the constitution appear to rally, and the quantity emitted is rapidly increased; then it again sinks, and afterwards slowly rises to the standard. This same species of oscillation Dr. Prout generally observed when the quantity has been suddenly and greatly raised or depressed from any cause; and he thought it might arise from the circumstance, that the animal powers are required to counteract the effects of a poison or other noxious agent, which might then stimulate them to overact their natural capabilities.

When vinous liquors are taken upon a full stomach, as after dinner, their effects are more slow, but not less sure and remarkable. Dr. Prout thought them even more permanent; but this, he admits, might arise from their having been taken in larger quantity, than he chose to do when the stomach was empty. As long as their effects are perceptible, so long is the quantity of carbonic acid emitted below the standard. With the experimenter himself these effects used to go off with frequent yawnings, and with a sensation as if he had just awaked from sleep. Under these circumstances he found the quantity generally much above the standard, and hence he thought it probable that the system was then freeing itself from the retained carbon.

It thus appears that vinous and spirituous liquors, which are generally accounted stimulants, though they may stimulate under certain circumstances and in certain doses the mucous surface of the stomach and alimentary canal, and even the interior of the blood-vessels into which they are received, act nevertheless as powerful sedatives, by preventing the elimination and causing the retention of carbonaceous matter, which in the normal and natural state ought to be eliminated. This circumstance further accounts for the loss of heat which invariably follows the administration and use of these liquors.

It is further a curious and important observation that very similar to the effects of alcohol are those of strong tea, whether warm or cold.

The depressing passions, as anxiety, grief, solicitude, uncertainty, in short, whatever produces that peculiar sensation which induces yawning, sighing, or any other deep inspiration, have evidently the effect of diminishing the quantity eliminated; these appearing, indeed, to be so many involuntary acts, by which the system endeavours to get rid of the retained carbon.

At the close of the essay Dr. Prout makes the following general observations on the particular organic system through which these effects may be supposed to take place, and also the influence of solar light.

"Of the causes operating to produce the above variations, no doubt the state of the circulation is to be considered as one. It is impossible but to suppose that when, *cæteris paribus*, a greater quantity of blood is exposed in a given time to the action of the air, that a greater quantity of carbonic acid gas must be formed, supposing this, at least, to be a common chemical process. It must, I think, be admitted, therefore, that this cause contributes in some degree to the production of the phenomena in question, though, there is every reason to believe, in a very limited one. A very superficial examination of the above experiments will show that the quantity of carbonic acid gas formed bears scarcely any proportion to the numerical state, at least, of the pulse. This, indeed, I admit to be a very imperfect criterion of the quantity of blood circulating through a part in a given time, unless its strength and degree of fulness be taken into the account; but it might be asked, has the pulse been noticed to be uniformly stronger and fuller in the middle of the day than at any other time? and is it not constantly so under the operation of hard exercise and the influence of wine?

"Mr. Brodie, in his excellent dissertations on the effects of poisons, has apparently demonstrated that respiration is altogether dependent on the brain; since, when the operations of this organ were destroyed or cut off, it almost immediately ceased; while the heart, which he found much less under nervous influence, continued for some time to act, and circulate dark coloured blood. He found also that alcohol, the essential oil of bitter almonds, and some other poisons, act as such simply by destroying the functions of the brain apparently by sympathy, and not by absorption; and that under the operation of these, respiration soon begins to be ill performed, and if their quantity has been great, at last entirely ceases. This, then, while it enables us to account for the effects of alcohol in our experiments, seems also at the same time to prove, in general, that another cause besides the mere state of circulation is immediately and largely concerned in the production of the phenomena in question. I conclude, therefore, that the *nervous system*, acting partly through the medium of the blood, and immediately by its influence over the function of respiration, is the grand source to which we must refer them all.

"The laws which we have attempted to establish are no other than modifications of that general principle which prevails over all living actions. A state of depression ever follows a state of excitement; and the greater that excitement has been the greater is the consequent depression. On the other hand, an uniformity of action at any point of the scale within which it ranges is no less incompatible with life than a great and sudden deviation towards either extreme. In all living actions, therefore, states of comparative rest alternate with states of exertion; and these alternations are evidently connected with the presence or absence of the sun; for according as this 'great source of life and heat' is present or absent, are organized beings, in general, either awake and active, or asleep and inactive. Now at noon this powerful agent of nature is at its height, and hence at this time may be supposed to exert his maximum energy; whatever, therefore, is under his immediate influence, must now be supposed to be affected most strongly; and if the

hypothesis be correct, that nervous action is so, it is perhaps easy to account for many important phenomena which it presents, and, among others, that of the greater elicitation of carbonic acid at noon, respiration being considered as under its immediate influence."

[Dr. Prout afterwards published some supplementary observations on this subject.]

He had mentioned in his first paper, that he was much struck with the sudden increase in the amount of carbonic acid eliminated from the lungs in the morning about the commencement of twilight. To determine whether this increase was accidental, or really was subject to the movements of the sun, he commenced a series of experiments about the winter solstice, and continued them till nearly the time of the summer solstice, the period thus including all the variations on the time of the sun's rising. The result of these experiments was, that the increase always uniformly occurred soon after the commencement of twilight and before sunrise, and the increase was greatest and most remarkable when the nights were longest, and that it gradually became less as the nights grew shorter. He allows that this may have been chiefly owing to a diminution having taken place in the usual minimum quantity towards morning, either probably from the fatigue of watching or from drowsiness.

The time of the evening diminution appears to be about the termination of twilight and the commencement of darkness. Dr. Prout infers, from various facts, that Law I., given in the first paper, requires to be modified, and instead of the periods there mentioned, 8 h. 30 m., p.m., and 3 h. 30 m., a.m., as the commencement and termination of the minimum, he substitutes the words, the ending and beginning of twilight.

In the second division of the investigation, the object of which was to determine the respective influence of modes of diet, and various alimentary, medicinal, and other physical agents, Dr. Prout found his former inferences very generally corroborated by the experiments of Dr. Andrew Fyfe, which had been made known in the interval subsequent to the first experiments of Dr. Prout.

Dr. Fyfe fixed the standard quantity of carbonic acid gas emitted from his own lungs under ordinary circumstances of health at about 8·5 per cent.

1. We found that, under the use of vegetable diet, this was reduced to about 4·5 per cent. Dr. Prout found, that on the seventh and eighth days of vegetable diet, the same amount of reduction took place.

2. The effects of animal diet, Dr. Fyfe found to be various. Dr. Prout found, that on the fourth day of diet with animal matters, the quantity of carbonic acid was 7 per cent., on the seventh and eighth days, 5 per cent.

3. Under the use of wine, Dr. Fyfe found the quantity of carbonic acid reduced to between 2 and 3 per cent., and in one experiment, to only 5·75 per cent. The experiments of Dr. Fyfe were not made till the day after the use of wine. Those of Dr. Prout were made immediately, and whilst the first effects were present.

4. Under the use of mercury, Dr. Fyfe observed a reduction to about 3 per cent. Dr. Prout observed a considerable diminution, varying from 2·80 per cent. to 4·5. The diminution, nevertheless, though perfectly real, was not often so great as that observed by Dr. Fyfe.

5. Under the use of nitric acid, Dr. Fyfe observed a reduction of between 6 and 7 per cent. Dr. Prout appears not to have made trial of the effects of this acid.

The paper is concluded by the following general observations, which must be studied in forming any estimate of the accuracy of these experiments.

"With respect to the numbers here brought forward, as well as those in my former paper, I wish it to be distinctly understood that they do not represent the measures of the quantity of carbonic acid emitted *in* any given time from the lungs, but the measures of the power or capability of the lungs *at* any given time, to form or throw off carbonic acid. This was not so distinctly pointed out in my former communication as it ought to have been. What I mean, then, to say is this, that the *power* or *capability* of the lungs for forming and throwing off carbonic acid is *greater* at noon, &c.; and not that a greater quantity of it *is actually thrown off* at that time than at any other. A greater quantity will indeed be thrown off, *cæteris paribus*, on an equal number of similar respirations being made in the same given time. But whether this be really the case or not, I cannot pretend to determine.

"If the hypothesis which was fairly advanced be founded in truth, it is evident that we have in these numbers a sort of relative measure of the degree of energy of the nervous system; but whether it be a measure of the energy of this system as it operates through the medium of the blood, or the muscular apparatus of circulation or respiration, or partly on all the three, I am unable to decide; that is to say, I do not precisely know whether the changes under consideration are to be ascribed to differences in the state of the blood itself, or to differences in the state of circulation or respiration, Perhaps all these causes may contribute in some degree to produce them.

"It is true that Dr. Fyfe did not observe at all these diurnal variations. But this has little or no weight, when the apparatus he employed is considered; since it was incapable of showing it, or at least the variations would be so extremely small that they would most likely escape observation. For my own part, I do not consider either my own experiments or his entirely conclusive on any one point. This is a thing that can hardly be settled by one or two observers. Indeed nothing but the striking uniformity that has occurred to me, and the little probability at present of my being able to repeat them in a less exceptionable manner, added to my wish of correcting as above what I formerly advanced, would have induced me to submit these observations to the world. Hence I content myself with little more than stating matters as I have found them, still waiving all speculations, however interesting they may be, till the matter has been thoroughly investigated, or at least much better examined into, either by myself or others."—*Edinburgh Med. and Surg. Journal, July* 1851, p. 129.

40.—ON ANGINA PECTORIS.

By James Kirk, Esq., Glasgow.

Definition.—Neuralgia of the branches of the par vagum, going to the heart and lungs; embarrassing the functions of these organs, and spreading by nervous connection to other parts; sometimes accompanied by organic lesion of the heart or great vessels, sometimes not.

Causes.—Predisposing; the middle age, the male sex, an indolent, luxurious, studious, or sedentary life; gout, rheumatism, or neuralgia; or worse than these, the long-continued anxiety of mind and fatigue of body, to which persons of high mind and narrow circumstances are, in the present state of society, so constantly exposed.

Causes.—Exciting, running, walking, especially up hill, or up stairs, great bodily exertion or mental excitement, and rapid changes of temperature: thus we most frequently see a severe attack after great exertion, a fit of passion, or on the evening of a cold wet day. As the disease increases in severity it will be found that slighter causes are sufficient to produce an attack; and that any one of them will occasion a seizure much more certainly after a meal. Finally, when the disease has become chronic, it may even attack the patient in his sleep.

Symptoms.—In the acute form of the disease the patient is suddenly seized with a sharp, darting, lancinating, or stabbing pain under the left breast, frequently spreading to the throat, arm, back, and leg of the same side; this pain frequently amounts to the most excruciating agony, and has been compared by Laennec to the piercing with nails or the laceration by the claws of animals; and is accompanied by a sense of suffocation, great difficulty of breathing, tendency to syncope, and flatulent distension of the stomach followed by eructations; together with the fear and the feeling of immediate death.

The pulse varies in different individuals; sometimes it is regular, sometimes irregular, sometimes weak, sometimes strong; but generally feeble and slow. After lasting for a longer or shorter time, proportioned to the severity and duration of the disease, the attack generally passes off spontaneously, or yields to the remedies employed.

A feeling of weakness and numbness sometimes remains for a little time in the parts previously affected with pain; but with this exception the patient may enjoy tolerable health, and show no sign of disease until again exposed to some of the exciting causes.

In the chronic form of the disease the attacks are often preceded by yawning and weariness; they are now more readily excited; the interval between them also is shortened, and the relief obtained afterwards more imperfect; the pain commonly lasting longer, but being less violent. In addition likewise to the anginous paroxysm the patient generally suffers from some other allied disorder of the nervous, digestive, or circulatory system, which may have been either a cause or a consequence of his malady; tic, dyspepsia, constipation, diarrhœa, (leucorrhœa if the patient is a female,) œdema, dropsy, or organic disease of the heart, may also be present to increase his suffering and diminish his hopes of recovery.

Diagnosis.—The only disease which bears any resemblance to angina is asthma; but the sharp pain in the breast and arm, and the sense of

suffocation characteristic of angina, can hardly be mistaken for the dyspnœa, cough, and expectoration of asthma.

Prognosis.—Angina is a disease not necessarily fatal when occurring in young subjects with no organic disease of the heart; but when it occurs in elderly people with organic disease of the heart or great vessels it is always mortal. In such cases, indeed, the organic lesion may be quite sufficient to account for the death of the patient, independent of the angina.

Pathology.—In the great majority of cases in which an inspection has been obtained after death, the heart or large vessels have been found diseased; but their pathological condition has been by no means constant or uniform. In some cases organic disease of the heart, the aorta, or the coronary arteries, have been found; in others ossification of the coronary arteries, ossification of the valves, ossification or dilatation of the aorta, or preternatural softness of the heart, have been discovered, after death. Indeed, in the words of Dr. Unwins, "there is scarcely any malformation of the heart or its blood-vessels that has not been occasionally found after death, from what would be considered angina pectoris ; while, on the other hand, individuals have fallen victims to the affection, fully marked, and the most accurate post-mortem examination has not been able to detect the slightest indication of structural derangement." In other cases again, according to Dr. Copland, the only morbid appearances have been found in distant organs; the heart and large vessels remaining sound. These appearances were "adhesions of the pleura; effusion into the pleura; thickening of the bronchial mucous membrane; dilatation of the bronchi; œdema of the lungs; abscess in the mediastinum; ossification of the cartilages and the ribs; enlargement of the liver, and scirrhus of the polyrus."

But, on consideration, it will be obvious that we must look to some other cause than the organic lesions just mentioned for an explanation of the terrible agony endured in this disease; seeing that singly and by themselves they do not account for it.

For, in the first place, these lesions are of very frequent occurrence, while angina is a rare disease; 2dly, these lesions are for the most part permanent conditions of the parts in which they occur, while this disease is intermittent; 3dly, these lesions may be present and the disease absent, or conversely, the disease may be present and the lesions all wanting; while in none of them does the patient endure the same amount of suffering as in angina; 4thly, we have seen a case in which tic preceded angina, or, in other words, the patient had neuralgia of the branches of the fifth pair going to the face, before those of the eighth (going to the heart) were affected by the same disease. These, and other reasons that might be mentioned, serve to show that something more than organic lesion is required to constitute the disease under consideration, and to confirm the opinion of Jurine, Desportes, Laennec, Chapman, and Copland, that it is a species of neuralgia of the pulmonary and cardiac nerves, affecting the functions of the heart and respiratory organs, and extending by nervous connection to other parts; the organic lesions found in fatal cases being either coincidences or effects of the disease."

Treatment in the attack.—If the pulse is full and strong, and the patient stout and plethoric, bleeding from the arm should be practised;

but if the patient is weak and debilitated, and the pulse feeble and slow, it should be altogether avoided. And instead of bleeding, a flannel wrung out of hot water and sprinkled with turpentine should be placed over the region of the heart; the feet put in hot water containing mustard, and sixty drops of laudanum given immediately in a glass of any strong spirit: if relief is not speedily obtained this dose may be repeated with perfect safety; and sometimes acts like a charm in relieving the pain. This should be followed by the exhibition of some antispasmodic and carminative, such as ether, aromatic spirit of ammonia, or ammoniated tincture of valerian in cinnamon or mint water, in order to assist the stomach to expel the gas which distends it; these should also be given after bleeding in those cases in which it is practised, for when greatly distended, as it commonly is in this disease, the stomach pushes up the left side of the diaphragm: this diminishes the capacity of the chest, and so impedes the movements of the heart. It is not to be supposed, however, that the distension of the stomach is the cause of the pain in the breast; for the pain at the heart is felt before the distension of the stomach is complained of.

Treatment in the interval.—In the first place it will be absolutely necessary to discover by the most careful examination what are the predisposing and exciting causes of the disease, in order to avoid them if possible, as well as to determine the actual condition of the heart and lungs by means of the stethoscope.

For example, attention should be paid to the patient's habits and manner of living; the state of the stomach, bowels, liver, (and uterus if a female;) the condition of plethora or anæmia, and the predisposition to gout, rheumatism, or neuralgia: in short, every appreciable disorder of the system is to be met by the appropriate remedies, and corrected as far as possible. If the stethoscope should enable us to discover any abnormal condition of the heart, the treatment must have a special reference to that condition: of course, where there is serious organic disease of the heart, a cure is not to be looked for; here the utmost we can do is to palliate the urgent symptoms. The remedies which have been found most useful are leeching, or cupping and counter-irritation over the region of the heart by means of croton-oil liniment, tartar emetic ointment, repeated blisters or issues, with low diet in the cases of stout plethoric individuals. With weakly debilitated subjects an opposite plan of treatment ought to be followed; tonics, such as bark and steel, should be exhibited with nourishment and cordials. Various other medicines have been recommended in angina; the preparations of iron, sulphate of zinc, nitrate of silver, arsenical solution, sulphate of quinine, mercurials, and colchicum, may all be prescribed with advantage according to the various indications afforded by the history of each individual case.

In addition to the above, we may mention that Laennec recommended magnetism, and Kneeland electricity; and that Heberden gave an opiate at bed-time when the attacks occurred during the night. Moreover, cases of every variety of complication will be much benefited by pure air and gentle exercise, together with an entire change of all the habits and circumstances prejudicial to the patient's well-being, in which the disease had its origin.—*Med. Gazette, August* 29, 1851, *p.* 382.

41.—LARYNGITIS—TREATMENT BY TOPICAL APPLICATIONS.

By Professor Bennett.

[A patient, Alexander Flint, a salesman, aged 27, was admitted into the Royal Infirmary, Edinburgh, on Feb. 17th, 1851, suffering from extensive lupus of the face, diarrhœa, Bright's disease, and scrofulous caries of the left knee-joint. Under treatment the diarrhœa ceased, the lupus was cured, and the disease of the kidney alleviated; but on the 24th of May, symptoms of laryngitis came on.]

On the 30th June, notwithstanding the assiduous use of astringent gargles, occasional sponging of the fauces with solution of nitrate of silver, and the application of leeches, he was evidently worse, and he could only speak in a whisper. *July 6th.*—To-day, Dr. Horace Green of New York, who went round the wards with Dr. Bennett, stated that this was a remarkably good example of what he had named follicular disease, affecting the larynx. He passed the sponge, saturated with a solution of nitrate of silver (℈ij. to ℥i. of water), through the larynx into the trachea. The patient could not take a breath for some seconds afterwards, and described the sensation as like that produced by a piece of food "passing down the wrong way, and causing choking." The immediate effect of the operation was decided improvement of the voice, and more ease in deglutition. From this time his symptoms gradually left him. On the tenth, the sponge was again passed into the larynx by Dr. Bennett, and produced the same sense of temporary suffocation; but immediately afterwards he spoke with perfect clearness of voice. The application was made every second day until the 16th, when all the laryngeal symptoms had disappeared, the voice was normal, and there was no cough, expectoration, pain, or difficulty of deglutition. He now left the house: the disease in the joint had made considerable progress, but the renal disorder was much alleviated.

Case 2.—Helen Guthrie, æt. 25, married, a fisherwoman, admitted into the Clinical Ward, July 4th, 1851. Four months ago was seized with a cough, attended with hoarseness of the voice, dryness of the throat, painful deglutition, and pain in the larynx, which symptoms have continued with greater or less intensity up to the period of admission. Latterly, there has been considerable expectoration of purulent matter, often tinged with blood. On admission she complains of cough coming on in paroxysms, dryness in the throat, and pain in the larynx, voice cracked and occasionally absent. There is no difficulty in swallowing, but copious expectoration of frothy mucus. Can inspire without difficulty. Percussion over chest elicits nothing abnormal. On auscultation, the inspiratory murmur is harsh over superior third of chest on both sides. Over larynx and trachea there is heard a dry snoring sound. On examining the fauces, red patches were observable here and there, with slight erosion on the left side. The fauces and epiglottis were sponged with a solution of nitrate of silver (℈j. to ℥j. of water). This was repeated on the following day, and the voice was evidently improved. On the 6th, the sponge, saturated with the solution, was passed into the larynx by Dr. Horace Green, of New York, and pro-

duced no feeling of suffocation whatever. It was passed afterwards every day by Dr. Bennett till the 14th, when she left the house, all the laryngeal symptoms having disappeared, and the voice nearly restored to its proper tone.

Commentary.—The two cases above recorded point out to you in a very marked manner the great advantage to be derived from the method of local application to the larynx, introduced by Dr. Horace Green, of New York. This practice consists in the direct application of a solution of nitrate of silver to the interior of the larynx and trachea, by means of a bent whalebone probe, with a piece of sponge fastened to its extremity. Numerous attempts had been made, with more or less success, by Sir C. Bell, Mr. Vance, Mr. Cusack, and MM. Trousseau and Belloc, to carry this practice into effect, and the results obtained, even by their imperfect efforts, exhibited the great advantages which were to be derived from it in the treatment of laryngeal diseases. Now, thanks to Dr. Green, we can with safety and certainty apply various solutions directly to the parts affected, and the two cases you have observed must convince you of the benefit which patients so treated may obtain. In case I. you have observed the progress of a tolerably acute case of laryngitis from its commencement to its termination,—the distressing symptoms produced, and the loss of voice occasioned. You have remarked, I trust, the gradual increase of the disorder, from its commencement on the 24th May until the 6th of July, when you saw Dr. Green himself pass the sponge into the larynx, and the immediate effect it occasioned. Lastly, from that moment you saw the case get better, and its termination in perfect cure eight days afterwards. No stronger evidence could be offered you in any single case of the benefit to be derived from a local application, especially when it is considered that the usual treatment was actively employed, consisting of leeches externally, gargles, and the application of a strong solution of nitrate of silver to the fauces, pharynx, and epiglottis. It was only when the application was made directly to the part affected that good was obtained. The second case, though more chronic, and though she went out before a perfect cure was obtained, is also calculated to impress upon you the value of this treatment.

The instruments to be employed are, first, a tongue depressor, with a bent handle, by means of which the tongue can be firmly pressed down, so as to expose the whole of the fauces, and the upper edge of the epiglottis. In doing this, some patients experience no inconvenience, whilst in others there is such excessive irritability, that spasmodic cough or even vomiting is occasioned, which prevents the possibility of seeing the epiglottis. Secondly a whalebone probang, about ten inches long, having at its extremity a round piece of the finest sponge, about the size of a gun or pistol bullet. The probang towards the extremity, must be bent in a curve, which, according to Dr. Green, ought to form the arc of one quarter of a circle whose diameter is four inches. Sometimes the curve must be altered to suit particular cases; and when it is thought necessary to pass it into the trachea, the curve must be considerably less. It is important that the sponge be fine, and capable of imbibing a considerable quantity of fluid; that it be *sewn* firmly to the

extremity of the whalebone, and that this last should not be cut in the form of a bulb, but tapered as much as is consistent with firmness.

The solutions of the nitrate of silver which will be found most useful are of two strengths. One is formed of ℈ij. and the other of ʒj. of the crystallised salt to an ounce of distilled water. On some occasions a solution of the sulphate of copper has been found beneficial, and it is very possible that, as our experience of this kind of treatment extends, the application of other substances in solution may be found capable of meeting particular indications. Dr. Hastings, of London, speaks highly of the bicyanurate of mercury employed in this way.

The method of introducing the sponge which I have found most successful is as follows:—The patient being seated in a chair and exposed to a good light, you should stand on his right side, and depress the tongue with the depressor held in the left hand. Holding the probang in the right hand, the sponge having been saturated in the solution, you pass it carefully over the upper surface of the instrument, *exactly in the medium plane*, until it is above or immediately behind the epiglottis. You now tell the patient to inspire, and as he does so, you drag the tongue slightly forwards with the depressor, and thrust the probang downwards and forwards by a movement which causes you to elevate the right arm, and brings your hand almost in contact with the patient's face. This operation requires more dexterity than may at first be supposed. The rima glottidis is narrow, and unless the sponge come fairly down upon it, it readily slips into the œsophagus. Its passage into the proper channel may be determined by the sensation of overcoming a constriction, which you yourself experience when the sponge is momentarily embraced by the rima, as well as by the momentary spasm it occasions in the patient, or the harsh expiration which follows,—symptoms which are more marked according to the sensibility of the parts.

If the probang be properly prepared, and the operation well performed, the actions which take place are as follows:—1st, The sponge, saturated with the solution, is rapidly thrust through the rima into the larynx, and frequently into the trachea; for if the distance of the probang be measured from that portion of it which comes in contact with the lips, the extent it has been thrust downwards can be pretty accurately determined. I am persuaded that on many occasions I have passed it pretty deep into the trachea, not only from the length of the probang which has disappeared, but also from the sensations of the patient, although this may be thought by some a fallacious method of determining the point. In this first part of the operation, the rima glottidis is as it were taken by surprise, and the sponge enters, if the right direction be given to it, without difficulty. But, 2nd, the rima glottidis immediately contracts by reflex action, so that on withdrawing the instrument you feel the constriction. This also squeezes out the solution, which is diffused over the laryngeal and tracheal mucous membrane. Now, if the sponge be a fine one, it will be found capable of holding about ʒss. of fluid, the effect of which upon the secretions and mucous surface almost always produces temporary relief to the symptoms, and strengthens the tone of the voice,—results at once apparent after the momentary

spasm has abated. 3rd, The action of the nitrate of silver solution is not that of a stimulant, but rather that of a calmative or sedative. It acts chemically on the mucus, pus, or other albuminous fluids it comes in contact with, throws down a copious white precipitate, in the form of a molecular membrane, which defends for a time the tender mucous surface or irritable ulcer, and leaves the passage free for the acts of respiration. Hence the feeling of relief almost always occasioned—that diminution of irritability in the parts which is so favourable to cure; and why it is that strong solutions of the salt are much more efficacious than weak ones. It may be easily conceived that such good effects must be more or less advantageous in almost all the diseases that affect parts so sensitive, from whatever cause they may arise; and that this treatment is not adapted to one or more diseases of the larynx, but, like all important remedies, meets a general indication which the rational practitioner will know how to avail himself of.

The mucous membrane of the larynx consists of ciliated epithelium externally, a basement layer below this, and areolar tissue internally, richly supplied with blood-vessels. Scattered over its surface are numerous follicles, which secrete mucus. It is liable to the same structural alterations as all other similar membranes, which may be divided into—1st, Exudation into the areolar tissue, between the basement membrane and epithelium, or upon the external surface; 2nd, Abrasions or desquamations of the epithelial layer: 3rd, Ulcerations extending more or less deep into the areolar tissue; and 4th, Obstruction, swelling and subsequent ulceration of the mucous follicles, a lesion particularly described by Dr. Horace Green, and denominated by him "follicular disease of the air-passages." These different lesions may be more or less complicated with each other, and will vary in intensity according to the rapidity of their progress, and the extent to which the mucous membrane is implicated. Sometimes the exudation is thrown out quickly and infiltrates the textures, as in œdema glottidis, or in malignant angina. At other times it is poured out on the surface, as in croup. More frequently it is partial, occasioning subsequent abrasion or ulceration, and is allowed to become chronic. Perhaps the most common form it assumes is when it is chronic from the commencement, sometimes dependent on atmospheric changes, at others following repeated attacks of "cold;" in a third class dependent on too much straining of the voice, as occurs in public speakers, clergymen, singers, &c., and occasionally connected with some general constitutional disorder, as syphilis, tuberculosis, or some form of cancer. All these forms of laryngeal disease may be further associated with similar lesions of the fauces, tonsils, uvula, and pharynx.

The symptoms will of course vary according to these different circumstances. The acute forms are accompanied with general fever, considerable local pain, more or less obstruction to deglutition and respiration, and loss or alteration of the character of the voice. As a general rule, it may be said that lesions of the fauces, tonsils, and neighbouring parts, are indicated by greater or less difficulty or uneasiness in swallowing, whilst the laryngeal disorder is evinced by changes in the character or power of sustaining the voice. Thus, as a general result of the local

irritation, spasmodic action is evinced, and we have cough, at first dry, but afterwards attended with mucous or purulent expectoration, and not unfrequently with discharge of blood. Elongation of the uvula may produce these effects. It has been lately supposed that hooping-cough is only an obscure form of laryngeal disease. In the more acute and extensive cases of exudative laryngitis, the spasms are more violent and prolonged, and the greatest caution is necessary in watching persons so affected, lest, from sudden and continued closure of the glottis, fatal asphyxia be induced.—*Monthly Journal of Med. Science, November* 1851, *p.* 462.

42.—*Membraneous Croup successfully treated by cauterizing the Larynx with Nitrate of Silver.*—Dr. S. D. Townsend was called early in the morning, to a girl five and a half years of age, who had been unwell for two days. The croupy breathing did not come on until a short time before he visited her. She was treated with Dover's powder repeatedly during the day, and the room was filled with vapour by immersing heated irons occasionally in a tub of hot water. Cauterization with nitrate of silver was practised at noon and in the evening without much relief; at twelve p.m., the croupy respiration increasing, the patient was fast sinking from suffocation; the pulse intermittent; the caustic was more effectually applied. Expectoration of a portion of the membrane, an inch in length and half an inch wide, followed in fifteen minutes; relief was immediate; ether was also inhaled with a happy effect, producing a pleasant sleep. Several portions of membrane were expectorated during the night and the following day, and the respiration became natural. No patches of lymph upon the tonsils or fauces were discovered. At this time, seven days from the attack, the patient is playful, with a good appetite. Expectoration purulent and bloody. Has had no return of dyspnœa, but still speaks only in a whisper.—*American Journal of Med. Sciences, July,* 1851, *p.* 85.

DISEASES OF THE ORGANS OF DIGESTION.

43.—ON THE GASTRIC JUICE.

By Dr. H. Bence Jones, F.R.S., &c.

[The conclusion which Dr. Bence Jones arrives at, as to the action and use of the gastric juice is, that its proper action is for the solution of albuminous substances. He says:]

That this action is promoted, first, by *temperature;* for it is found that at an ordinary temperature, say from 54° to 60°, the temperature of this room, no solution takes place. I have the contents of a stomach, which have been here for many hours, and probably there is not now a particle more in solution than when the contents were first removed; the temperature of the room has been sufficiently low to check all further action;

and it must be raised to 96° for a further solution to take place. The next great agent is *motion*. During the time of digestion, a certain motion is, without doubt, constantly taking place in the stomach; but digestion may take place without any such contraction or gentle rubbing as one may suppose the stomach to be undergoing: this is proved by the fact that food will digest when placed in perforated balls, which allow the mixture of the food with the gastric juice. Thirdly, *salts* are of importance in the process of digestion. Common salt, without doubt, promotes the secretion of acid by its irritation and by its chemical action on the mucous membrane of the stomach. If very much common salt, however, is taken, the process of digestion appears to be retarded. So also with other salts. It is probable that even *calomel* has this property of stimulating the mucous membrane of the stomach, and thus, at times, of aiding the digestive process. Another great agent in promoting the action of the gastric juice, is *the removal of substances as soon as they are dissolved*. As soon as substances are dissolved they are enabled to escape, some of them by being absorbed into the veins, and some of them by passing out through the pylorus. That some of these soluble matters are constantly being removed from the stomach by the veins is proved by tying the pylorus, and finding that in the case (for instance) of a stomach filled with milk, the watery part of the milk will be taken up from the parietes of the stomach by the veins, whereby the casein is left and is much more slowly dissolved, it is certain that the solution is always going on, that a part of the contents of the stomach is always being dissolved, while the process of digestion is proceeding. Lastly, it has been shown by the experiments of German physiologists, that atmospheric air is not at all necessary to aid digestion. If the contents of a stomach be placed in a perfectly air-tight vessel, and exposed to a proper temperature, digestion will take place.

We come, then, to the conclusion, that the ferment in the saliva is the substance which acts chiefly upon the most important non-nitrogenous constituent of our food, namely, starch; and that the ferment in the gastric juice acts chiefly upon the albuminous or nitrogenous constituents. Agents that stop fermentation stop digestion; for example, strong acids, alkalies, heat, alcohol. The stomach ferment differs from the saliva ferment, in losing its action when heated, or when treated with strong acid or alcohol; also by its necessary union with an acid. The acid determines the mode of action and regulates it. If carbonate of potash or soda is added in excess, a totally different action of the ferment ensues, decomposition begins. Slightly altered ferment, like slightly altered yeast, may set up lactic or butyric acid fermentations, and there is reason to suppose that acetic acid fermentation may also occur. You will remember that the substances existing in the food I divided thus:— Water, which can be taken up of itself; mineral matters, which are soluble in water or in dilute acid; non-nitrogenous organic substances, some soluble, as sugar, and others, as starch, insoluble in water, but acted upon immediately by the saliva; others, as cellulose, insoluble even by the saliva or gastric juice, and which cannot, therefore, serve for the nutrition of the body; and, lastly, nitrogenous substances. The fluid which acts upon this last class of substances is the gastric juice; it is the

proper agent for rendering them soluble. It converts the albumen, fibrin, and casein, into albumen peptone, fibrin peptone, and casein peptone, which are soluble in water, and are, therefore, easily taken up into the body to serve the purposes of life.—*Med. Times, June* 14, 1851, *p.* 635.

44.—ON THE VARIATIONS OF DIFFERENT INGREDIENTS OF THE BLOOD BY MEANS OF FOOD.

By Dr. H. Bence Jones, F.R.S., &c.

[In the blood we have water, salts, albuminous substances, and non-nitrogenous organic matter; the effect of food upon these substances is very interesting.]

In the following diagrams are represented the effect of food on the amount of albumen, fibrin, and fatty matter in the blood. You will observe, that after starvation, the quantity of albumen present in the blood is 66·8 parts in 1000 parts of blood; and after food, 90·8 parts in 1000; showing a decided increase produced by food. In the blood of man, when a mixed diet was taken, albumen 53·2 parts per 1000 parts of blood were found; on animal food, the 5th day, 58·7 parts; the fourteenth day, 62·7 parts per 1000. The fourteenth day of vegetable food, 51·0 parts albumen; showing that animal food decidedly increases the albumen in the blood, and that vegetable food does not produce so decided an effect.

With regard to fibrin: the blood of man, when no food was taken, gave 1·8 parts per 1000 parts of blood (the average being about 3 per 1000); after animal food, the third hour, the fibrin was 1·5 parts per 1000; the fifth hour, 1·6, &c.; so that the digestion of food does not seem to increase the fibrin of the blood. After the eighth hour, however, when digestion must be ended, the amount of fibrin comes back to the amount which was present before food was taken.

Effects of Food on the Albumen, Fibrin, Water, Salts, and Fat in the Blood.

	Per 1000 parts of Blood.
Albumen—Horse after starvation	66·8 parts.
,, food	90·8 ,,
Man—mixed diet	53·2 ,,
,, animal food ...5th day	58·7 ,,
,, ,, 14th day	62·7 ,,
,, vegetable food 14th day	51.0 ,,
Fibrin—Man after no food	1·8 ,,
,, animal food 3rd hour ...	1·5 ,,
,, ,, 5th ,, ...	1·6 ,,
,, ,, 6th ,, ...	1·5 ,,
,, ,, 7th ,, ...	1·4 ,,
,, ,, 8th ,, ...	1·8 ,,
Dog, starvation 11 days	1·5 ,,
,, 9 days	2·7 ,,
,, after full animal food	2·2 ,,

	Per 1000 parts of blood.
Water—after animal food	784 ,,
after vegetable food	792 ,,
Salts—Twenty-four hours' starvation	6·9 ,,
Eight hours after animal food	8·2 ,,
,, ,, vegetable food ...	7·7 ,,
Fat—Twenty-four hours after starvation ...	2·0 ,,
After animal food	2·9 ,,
,, vegetable food	2·1 ,,
,, nine days' starvation	1·7 ,,
,, eleven days' starvation	1·4 ,,
In disease	117·0 ,,

I deduce, then, from this table, that the fibrin is not increased by food. In a dog starved for eleven days as much fibrin was present in the blood as was usually found when food was taken; and, after nine days' starvation there was found as much as 2·7 parts of fibrin in 1000 parts of blood. With regard to the influence of different kinds of food, one animal was kept for weeks on flesh only, and another was kept for the same time on vegetable food only; both were bled from six to nine hours after a meal. The proportion of fibrin in the two specimens of blood was represented by 9 to 7.

With regard to the salts in the blood, there are, after twenty-four hours' starvation, 6·9 parts of saline matter in 1000 parts of blood; eight hours after animal food 8·2 per 1000; after vegetable food 7·7 per 1000.

As regards the effect of food on the amount of fat in the blood, after twenty-four hours' starvation, there are 2 parts of fat in 1000 parts of blood. The Table shows that starvation causes a gradual diminution of fat, and that food causes an increase, but in some states of disease the amount of fat is increased far beyond the healthy limit. I believe that 117 parts of fat in 1000 parts of blood is the highest ever known to have occurred in man.

The quantity of water after animal food is 784 parts of water in 1000 parts of blood, and after vegetable food 792 per 1000; so far showing that vegetable food causes a more watery state of the blood than animal food does. Still the quantity of water in the blood is not very closely dependent on the quantity of water which is taken into the system. On this point some very interesting experiments have lately been made. Two dogs were kept for some weeks on the same food, except as regarding the quantity of water given to them. One dog was not given any water, and the other was made to take a large quantity. It was found afterwards that the specific gravity of the blood taken from the two dogs varied very little. It was almost the same in both.

Still very large draughts of water do occasionally produce very decided effects on the blood of animals. If, after the blood has been drawn, I take the blood-globules, and mix them with distilled water, and then examine the liquid under a microscope, I shall find, if sufficient water has been added, that the blood-globules will have ceased to exist. Pure water has a powerful action upon them. It bursts, and breaks and dissolves them, causing them to vanish entirely. A clear solution like

this of blood-globules is formed. Now, the same action is said to take place in animals after very large draughts of water. It is stated that in oxen, after taking immense draughts of water, the blood-globules have been so acted upon as to become dissolved, and that the colouring matter has passed out of the body. This has continued until so much water has passed from the animal as has sufficed to restore the proper specific gravity to the blood.

I have here a liquid containing blood-globules, in a strong solution of sulphate of soda. The quantity of sulphate of soda is so considerable in proportion to the water, that the globules are unacted upon. If the blood had been put into distilled water, instead of into a solution of sulphate of soda, the globules would have been dissolved, and have formed a clear, colourless liquid. It is simply the salts of the blood which hold the albumen in solution; and it is these same salts, also, which prevent the coloured globules from being dissolved.

Thus much regarding the influence of the food on the substances in the blood. You will find more on this subject in the pamphlet of Nasse, on the 'Influence of the Food on the Blood'; in the pamphlet of Mulders, on 'Nourishment'; and in 'Lehmann's Chemistry,' under the head of 'Blood.'

[Another interesting inquiry entered upon by Dr. Jones, is the relation of the blood to the substances which are passing out of the body—to the excretions.]

One of the most interesting substances, and certainly the most important one, is carbonic acid, which passes out by respiration. By a very easy and beautiful experiment I can show you its presence in the blood. I have here an apparatus which will produce hydrogen. I have a tube full of caustic potash, which will stop any trace of carbonic acid which can possibly exist. Sulphuric acid is made to act upon zinc so as to produce hydrogen; this hydrogen passes through the solution of caustic potash; it then passes into another vessel, into which, when filled with the hydrogen, some healthy blood is put; the hydrogen bubbling through this, passes through some lime-water in other vessels; and if it carries with it any carbonic acid, the lime-water will of course become turbid. You see how rapidly this turbidity is produced. Carbonic acid, then, is a substance which exists in the blood, and is passing out each moment by respiration. The proportion of carbonic acid to oxygen, in arterial blood, is as 16 of the former to 6 of the latter; and, in venous blood, 16 carbonic acid to 4 oxygen. This proportion was determined for us by the German chemist, Magnus. He found that the quantity of nitrogen was the same in both kinds of blood. M. Majendie states, that in venous blood, in every hundred volumes, there are seventy-eight volumes of carbonic acid gas, and in arterial blood 66 per cent.

Other substances can be obtained from the blood which are constantly passing out of the body in the urine. The most interesting of these are uric acid and urea, substances which form the peculiar characteristic constituents of the urine. These can be found in small quantities in healthy blood. I have here a beautiful specimen in long crystals of urea obtained from the healthy blood of an ox, for which I am indebted

to M. Verdeil. It is obtained by drying the serum of the blood, reducing it to the finest powder, mixing it with alcohol, and then pouring off the alcoholic solution, which, in health, always contains small quantities of urea. In some diseases the quantity of urea in the blood is considerable—as for instance in Bright's disease. In this disease the blood-globules are exceedingly diminished—the albumen is constantly passing out in the urine; and it is always found that urea is one of the constituents of the serum. It may be obtained thus:—Here is the serum of patient who was bled in St. George's Hospital. Here is a portion evaporated to dryness; a part of this dry residue is treated with absolute alcohol, the alcoholic solution is evaporated in vacuo to dryness; and the dry residue is dissolved in a little water; on the addition of nitric acid nitrate of urea as you see immediately crystallises.

Uric acid is also found in the blood in health and in disease, combined with soda. It was discovered by Dr. Garrod. of University College; he states that it exists in increased quantity in the blood of gouty subjects; and, from my own experiments, I can confirm the truth of his statement. Dr. Garrod also says, that he found in Bright's disease urate of soda in excess in the blood. In that disease the kidney is prevented from performing its proper functions; the ingredients of the urine are not separated as they should be, and thus urea and uric acid accumulate in the blood. Uric acid, like urea, can be easily detected, by taking the serum, or the blood as a whole, evaporating it to dryness, reducing it to the finest powder, and treating it with boiling water; urate of soda will thus be obtained in solution. The liquid is filtered off from the insoluble albumen, and the clear fluid is mixed with strong acetic acid, and set aside to crystallize. The uric acid adheres to the sides and bottom of the glass. It may be collected, and will give the characteristic reactions with nitric acid and ammonia.

Kreatin, which I formerly mentioned as one of the constituents of the flesh, probably exists in the blood. It exists certainly in the urine, as I shall have to show you. Hippuric acid, also, which exists in the urine, especially in graminiverous animals, has been found in the blood. It was detected in the blood of an ox, by M. Verdeil. Lastly, Dr. Garrod also considers he has found oxalic acid in the blood of a patient in University College Hospital.

Thus, then, there exists in the blood not only the substances which pass into the body as food, but the substances which pass out in the excretions. I have said that the great peculiarity of the blood is, that it contains fibrin and the red globules; these substances cause the blood to differ from all other fluids. The spontaneous coagulation and the red colour are caused by the globules and the fibrin; neither of which exists ready formed in the food, nor are they ever found in the healthy excretions. If it were not for these substances, it might almost be said that the blood was nothing but a solution of food passing in, and of substances passing out of the body; it is, then, by the formation of the fibrin and blood-globules, that the blood is made a peculiar substance,—an organised liquid, which may live and die like the more solid organs of which we are composed.—*Med. Times, August* 2, 1851, *p.* 115.

45.—ON THE BILE.

By Dr. H. Bence Jones, F.R.S., &c.

[The bile has long been a subject of the greatest speculation on the part of physiologists, and there is scarcely any theory which has been advanced on the properties of the bile, which has not been defended by some writers. Dr. Jones compares it more to a kind of soap than anything else, and proceeds to enquire:]

What is the physiological action of the bile? The most opposite and the most important actions have been attributed to it. It has been said to promote digestion, and to stop digestion. Some say that it neutralises free acid, thus lessening irritation; others, that it increases the peristaltic action of the bowels, thus increasing irritation. It has been said to be partly absorbed into the system to support respiration, by furnishing a highly carbonaceous body. Some have said that it promotes the absorption of fatty substances; and by others it has been said to have no action upon fats at all. To solve these questions was the difficulty. Experiments were tried by tying the common duct through which the bile passed; but this is not the way to arrive at a satisfactory result. If the bile is not suffered to pass, a stoppage is put to the functions of the liver; the whole order of the system is thrown out, and general disorder is produced. In 1844 a new mode of experimenting was begun by Schwann, who collected the bile without allowing it to pass into the intestines, by means of an opening similar to that which I mentioned in the case of the pancreatic duct. The action of the liver thus went on as usual, and all the functions of the body were performed without impediment. Twelve dogs lived from sixty-four to eighty days without any bile passing into the intestines; one dog, thus experimented upon, lived four months; and another, belonging, I believe, to M. Bernard, lived a year in this state. It was found that dogs thus treated ate much, and digested badly, partly in consequence of the unnatural fistulous opening. They did not lose much weight at first; but after a little time they lost their appetite, became thin, and ultimately died. The bowels acted as regularly and perfectly as if the bile had passed in the usual manner. Professor Nasse had a dog that lived from the 12th of August to the 27th of January. The quantity of bile varied with different kinds of food between 31 grains and 370 grains daily, with from 16·44 to 19·19 per cent. of solid constituents. Less was secreted when the dog was ill. The dog ate much; digested badly; did not lose weight at first; afterwards lost its appetite, and then became thin. M. Blondlot had a dog that flourished for three months. The bowels acted twice daily.*

Even in human subjects, it has been found that when a fistulous opening has been made, owing to perfect obstruction of the common duct, by inflammatory action, the bowels have continued to act when the bile did not pass,—showing that the bile is by no means indispensable for their action.

* At the meeting of the French Academy, on the 23d of June this year, M. Blondlot gave the history and post-mortem of a dog that lived for five years without bile passing into the intestines.

Many experiments were tried with dogs, as to the quantity of bile secreted. The influence of medicine was also tried; and it is interesting to us to know that the action of mercury was decidedly to increase the quantity of bile secreted, as has long been held by medical men. If animals can live for a year, enjoy tolerable health, and digest their food, without any bile passing into the intestines, the importance of bile, and its necessity for the purposes of digestion have been exaggerated.

The action of bile out of the body on the different constituents of food, tends to precisely the same results as we have seen obtained by experiments in the body. Bile, when mixed with neutral fat or with oil, is found to have no chemical action whatever. It makes a sort of emulsion only, not quite so good as that produced by the pancreatic fluid. I added to solutions both of pancreatic juice and bile, equal quantities of water and oil, and then left them, after agitation for some time, to see which produced the most enduring emulsion. You see them here; both have caused the fatty matter to be minutely divided; but I think the pancreatic fluid has divided it and kept it divided the best. When fresh out of the body bile has no action on starch; it does not change it into sugar, as we saw the saliva did. When, however, it is allowed to decompose, it has a slight action upon starch; but not more than all animal substances have. It has no action on cane-sugar until after it has stood for a considerable length of time, and then the cane-sugar is converted into acid. With grape-sugar, if left for any length of time, it forms lactic acid; but so do all other animal substances when in contact with sugar. It has no action, even when acidulated on casein, or on the albuminous substances which constitute our food.

It has been said that the liver purifies the blood by removing a large quantity of carbonaceous substance from it. To determine this by absolute experiment was a matter of great difficulty; but Schmidt has endeavoured to solve this question by experiments on forty cats, thirteen geese, many sheep and rabbits, in which he made fistulous openings into the gall-ducts for the purpose of collecting all the bile and of determining the proportion between the quantity of carbonic acid thrown out by the lungs and the quantity of carbon in the bile. He passed a tube into the gall-duct, and could measure how much gall came out per hour; and he could determine the composition of the bile by burning it and collecting the carbonic acid. He made, at the same time, comparative experiments on the respiration, some of which I shall have to detail to you in a future lecture; and he came to the conclusion that not more than from one-tenth to one-fortieth of the carbon which passes out of the body passes by the liver, and that therefore the liver has no considerable action in freeing the blood from carbonic acid or carbon. He found that eight-ninths or nine-tenths of the carbonaceous matter remains in the circulation, and does not pass out by the bile at all, but is thrown out through the lungs; a small portion, however, must escape in the urine, probably not much less than passes out in the bile. But I am unable to give you the proportion of carbon in the urine and bile daily excreted, from want of experiments.

What, then, in conclusion, are the uses of the bile? I have shown you that it is an alkaline fluid, and a body resembling soap. If soap is

brought into contact with an acid, you know what happens: the alkali of the soap and the acid combine, and the acid of the soap is set free and precipitated. So, also, is it in the bile. If I take human bile, and mix it with acid, (as you see in the experiment with sulphuric acid,) a greenish white precipitate is formed. Let me show you what would happen to human bile, if mixed with the acid secretion of the stomach. This I can do by adding dilute hydrochloric acid to a portion of bile, or better still by mixing some of the clear fluid obtained from the contents of the stomach, which I showed you in my lecture on the gastric juice; by both a precipitate will be immediately produced. The alkali which exists in the bile goes to the acid; it neutralizes so far, the acid reaction coming from the stomach; and it precipitates the insoluble acids, which give rise to choloidynic acid, and even to that still more insoluble substance, dyslysin, in its passage through the intestinal canal. It appears to me, then, that one great action of the bile is to furnish an alkaline fluid, which, when mixed with the acid secretion that has served the purpose of dissolving the albumen, will neutralize it, and lessen its acidity, so as to prevent it from producing irritation and increased action of the intestinal canal. That the stomach can actually bear much stronger acid than the bowels is known to most medical men. That the acid does not pass rapidly out of the stomach I am convinced by the following experiment:—To an adult man I gave 162 grains of dry, pure tartaric acid dissolved in two ounces of water. No pain was felt for three hours; no food was taken during this time; and, without doubt, all the tartaric acid would in these three hours have been absorbed, or would have passed out of the stomach. At the end of this time, a pain in the bowels began to be felt, and at the end of the fourth hour there was very considerable pain, coming on in paroxysms. At the lapse of about five hours, if the bowels had been allowed to act, they would have acted from the acid thus taken. A repetition of the experiment, with 84 grains, gave precisely the same results. When the acid entered the bowels, pain began to be felt, and, if bile in plenty had been poured out, the acid would have been neutralized, in part at least; the alkali would have combined with the acid; the insoluble bile acid would have been formed as a precipitate, and been thrown out of the body. If this be so, sluggishness of the liver, a deficiency of alkali poured into the duodenum, becomes a reasonable cause of excessive acidity of the intestines; the gastric acid required to dissolve the albuminous food, if sufficient bile is not formed, will pass into the intestines, and produce irritation and increased action. The physician has long held, that want of action of the liver gives rise to acidity, and that alterative medicines correct this state.

But the very great size which the liver attains in the fœtus appears to indicate that it performs some additional action independent of food and of digestion. This additional action has been said, by German physiologists, to be the reparation and the formation of blood globules; but this is by no means proved. It seems to me much more probable that it is for the purpose of neutralizing the acid, and probably also, for the purpose of removing, when requisite, some of the carbonaceous substances; in certain states compensating for the action of the lungs, though, in ordinary states, removing much less carbon than has been said. The bile

gives water, moreover, to dilute the chyle; it tends to the subdivision, in some degree, of the fat and the oil of our food. It acts upon the free acid of the intestine; and some of it may be possibly absorbed, and pass into the circulation again, as Professor Liebig originally conjectured. It is not nearly so important as the gastric juice, which dissolves the albuminous part of our food, or the pancreatic fluid, and the salivary fluid, which convert all the insoluble starch, as I have shown you, into soluble sugar. Lastly, the importance of the bile in forming sugar from fat, is one of those facts which cannot be overrated. By this discovery of M. Bernard's, very important knowledge relating to the physiology and pathology of man will be obtained during the next few years; at least there can be little doubt, that the disease known as diabetes, if not closely connected with this production of sugar in the liver, must at least be influenced by it to a very considerable extent.—*Med. Times, July* 5, 1851, *p.* 1.

46.—*Inutility of the Bile as a Modifying Agent in Digestion.*—M. Blondlot gave it as his opinion, before the Academy of Sciences of Paris, that the bile exercises no chemical action on the chyme, and that digestion would proceed just as well without the interference of bile. He considers the latter fluid as a kind of detritus, of which the economy frees itself by means of the intestines,

M. Blondlot has been at great pains to set up biliary fistulæ upon dogs, so as to allow the bile to pass out of the body without reaching the intestine. After many trials he succeeded upon two dogs; one of these was killed one month after the establishment of the fistula, and it was found that digestion had been properly carried on, and that the ductus communis choledochus was already occluded.

The second dog lived *five years* with the fistula; it was a bitch, about four years old, who continued to enjoy good health, littered every year, and was a good pointer. The bile escaped all this time; very scantily, however, when the animal was fasting, but very abundantly during the whole period of digestion. The bitch died after five years; the liver looked cirrhosed, and the ductus communis was quite atrophied. M. Blondlot, therefore, maintains that the bile is a mere detritus, which may, however, serve to protect the intestines from the irritating properties of the chyme, or aid, with other mucous fluids, in dissolving fatty constituents.—*Lancet, August* 23, 1851, *p.* 177.

47.—*On Aphtha and its Important Relations as an Epidemic Disease.*—By John Grove, Esq.—[The conclusions Mr. Grove arrives at, from his investigations upon this subject are:]

1st. That aphtha is a disease depending upon and caused by vegetable germs.

2nd. That, in all probability, muguet aphtha and diphtherite are associated affections, depending on a common primary agent as a cause of disease.

3rd. That the same general laws are operative on aphtha, diphtherite, and muguet, in their endemic and epidemic forms as are known to apply to other endemic and epidemic affections.

4th. That, as analogical argument gives a preponderance in favour of living germs being the cause of epidemic disease, and that as such germs have been demonstrated to be the primary cause of aphtha, itself an epidemic affection, we may conclude that this is a type of all diseases which obey the same laws.—*Med. Times, July* 26, 1851, *p.* 98.

48.—*Gastralgia. Treatment by the Subnitrate of Bismuth, united with Belladonna.*—The subnitrate of bismuth enjoys a certain reputation in the treatment of gastralgia. It cannot be said, however, to be an active and faithful remedy. Sometimes it does not act even in a large dose; at other times, its action is no longer exercised in cases where it had previously been administered with success. According to Professor Caizergues of Montpellier, the subnitrate of bismuth is more efficacious when united with belladonna. He orders this mixture in painful affections of the stomach, properly so-called, and which are isolated from all inflammatory complication, and against affections of the stomach which are connected with a positive disease, or a general morbid state, like chlorosis, for instance. The Professor generally employs the following formula. ℞. Subnitrate of bismuth, ten grammes, extract of belladonna one gramme; make forty pills, two to be taken night and morning.—*London Journal of Medicine, August* 1851, *p.* 720.

49.—*Pathology of Diabetes.*—We reprint the following from the 2nd vol. of the 'Transactions of the American Medical Association.' "For all practical purposes in the present state of our knowledge, we may, in the opinion of Dr. Todd, adopt with advantage the following view of the pathology of diabetes. 'That it is primarily a disease of the mucous membrane of the stomach, whereby an abnormal diastase is formed, which rapidly converts into sugar such aliments as admit of that conversion; the mucous membrane probably likewise secretes sugar; the sugar thus formed, passes into the blood, and is rapidly eliminated by the kidneys, causing, at the same time, the attraction to those organs of the elements of a large quantity of water.'"

"Very much to the same point are some interesting remarks of Professor Flint, in a late number of his Journal (Prov. Med. and Surg. J.,) on the pathology and treatment of this affection. 'The presence of sugar in the blood and various secretions other than the urine,' he remarks, 'renders it inappropriate longer to rank diabetes among renal diseases. It is a disease affecting the assimilatory process, in consequence of which, sugar ingested passes unchanged into the blood-vessels, and alimentary principles capable of being converted into sugar undergo that chemical change. The kidneys are involved only as one of the excretory outlets by which this useless saccharine material is eliminated from the system.

The hyper-secretory action of the kidneys, (which is probably due to the presence of sugar acting as an excitement), constitutes an important element of the disease. This will serve to explain, in part, the dryness of the surface, the costiveness, the thirst, &c. The loss of those alimentary principles which contain sugar, or are capable of conversion into sugar, for all purposes of healthy assimilation, will explain the debility, the wasting, and the great gravity of the disease. We have thus advanced a considerable way in our knowledge of this disease; but we are still at a distance from knowledge of the nature of the perversion which the processes of assimilation undergoes, and of the ulterior morbid condition upon which the perversion depends. In other words, its true pathology and etiology are still unknown. The knowledge, however, which has been acquired, is not without its practical value. It prevents, in the first place, treatment based upon the idea of its being essentially a urinary disorder, and other false pathological views, and in this way saves the patient from measures which might prove not only useless, but injurious. This, although negative, is nevertheless not the least important of the advantages which attend an improved knowledge of diseases generally. . . . . Our rational course, in the present state of knowledge, is to endeavour to restore the proper action of all the functions; and especially to modify and improve the processes of assimilation."

M. Mialhe believes that diabetes "depends upon a want of sufficient alkalinity in the fluids of the body; that the transformation of amyloid substances into sugar, is not peculiar to diabetic patients; it is not an accidental phenomenon, but a necessary part of the digestion and assimilation of food; that this is brought about by an animal *diastase* in the saliva, which he has discovered; that amyloid substances must in all animals, without exception, be converted into sugar under the influence of this diastase. *But what becomes of this sugar?* It must participate in nutrition, and, in order to do this, it undergoes certain transformations; for in the normal state, it is not detected in any of the secretions. Its passage through the kidneys is pathological, and depends upon a disturbance which has its origin in the want of alkalinity in the blood. The alkalies in the blood, M. Mialhe contends, are the principal agents in the digestion and assimilation of saccharine and amyloid substances. The saccharine principle must undergo farther transformations to be assimilable. In the healthy subject, the alkalinity of the blood is sufficient for this decomposition; but if this be deficient, the transformation fails to take place; the sugar becomes a foreign body, and is cast off, not only by the kidneys, but by all secreting surfaces, and *we have diabetes*. The cause of this affection may therefore be traced to a defective assimilation of the sugar, through a want of alkalinity in the animal economy Human blood is naturally alkaline, but would eventually become acid, through the ingesta, but for the counterbalancing effects of especial secretions—the urine and the perspiration, which when normal, are always acid. The saliva and the tears are uniformly alkaline."—*London Journal of Medicine, July* 1851, *p.* 666.

50.—*Autumnal Diarrhœa.*—[Where the cases assume an intermittent type, we are advised to combine the use of quinine with other remedies.]

In our own practice, we have found nothing so successful in the majority of cases as an opiate draught, followed in two hours by a full dose of castor oil; and then a short dose of quinine with minute quantities of iron. Dr. James Bird, two years ago, said "Dr. Cormack, of Putney, informs me that acting on a suggestion which he (Dr. Bird) had made to him, now nearly twelvemonths ago, he has found the citrate of iron and quinine one of the most useful medicines which can be given in the *cholerine*, now almost universal on the Surrey side of the river." (London Journal of Medicine, 1849, p. 842.) Dr. J. P. Evans, of Tazewell, Tennessee, in an Essay on "*the Diarrhœa of the South,*" in the Charleston Med. Journal and Review for May, 1851, writes as follows:—"While in Mexico, I was furnished with various *recipes* for diarrhœa, of the precise elements of which I made no record, but some of them emanated from respectable sources, and I noticed that quinine entered into the composition of many of them, particularly of some which were reputed to be of great value in the region of the Rio Grande." . . . "It is very probable that it (quinine) might be profitably employed even where periodicity could not be traced, as, according to Professor Drake, it is a sedative and antispasmodic narcotic."—*London Journal of Medicine, Aug.*, 1851, *p.* 722.

51.—*On the Use of Creasote in Diarrhœa.*—By B. W. Richardson, Esq.—[Mr. Spinks, of Warrington, has never seen so good an astringent as creasote in diarrhœa, although he has not used it in true asiatic cholera.]

The cases in which it is most useful are of three kinds:—1st. Cases of diarrhœa during ordinary epidemics, where the disorder cannot be traced to the presence of foreign matter in the intestines. 2nd. Cases where profuse diarrhœa follows the employment of purgatives, given to remove foreign matters during intestinal disorders. 3rd. Cases in which, after an acute diarrhœa, the patient continues to be troubled with frequent and sudden liquid evacuations, not attended with pain or great constitutional disorder. Illustrative cases were supplied. The advantages of creasote are the following:—It often succeeds when all other astringents fail; of this the author is thoroughly convinced from repeated experiments; it is speedy in its action; lastly, it does not leave the bowels constipated, unless carried too far in its administration. Occasionally, during its use, it produces a dry, white, filmy state of tongue, and other symptoms of feverishness. When this occurs the remedy must not be continued longer; indeed, it is rarely required after such symptoms, the purging being usually arrested before they appear. With children the dose given must be very small, or such good results will not follow; the one-eighth, one-sixth, and one-fourth part of a drop, is sufficient for babes from one to two years of age. With adults the dose, as an astringent, is from one

and a half to two minims. A late writer in the 'Medical Gazette' (Mr. Kesteven) had also alluded to the value of creasote as an astringent, and had opined that this value depended on the power which creasote was known to have, of coagulating albuminous fluids. To this it may be objected, that the quantities of the creasote employed medicinally are not sufficient to produce such coagulation in the intestines. Mr. Richardson also alluded to other effects of creasote. He denied that, in ordinary doses, it possessed some of the properties described as belonging to it in elementary treatises on therapeutics, such as narcotic, sedative, and diuretic properties. At the same time he assigned to it powerful diaphoretic and anti-spasmodic qualities, and said, that on the vascular system it rather acted as a stimulant than as a sedative. Its power in stopping vomiting depended upon the dose, which should be small. Given in its full dose, as an astringent, it sometimes *excites* vomiting, in which case hydrocyanic acid is usefully combined with it. To lessen its nauseous qualities, it is best to unite it with syrup of tolu and tincture of cardamoms, and camphor julep or water. It may also be prescribed advantageously with the preparations of ether when they are indicated.—*Lancet, October* 25, 1851, *p.* 393.

52.—ON THE TREATMENT OF DYSENTERY BY ACETATE OF LEAD.

By Dr. J. P. Batchelder.

[If there is much symptomatic fever, with full, frequent, especially hard pulse, and the patient possesses an ordinary constitution, Dr. Batchelder places blood-letting at the head of the treatment. The next remedy is the acetate of lead and opium. This remedy should be given immediately after the bleeding; or immediately, whether venesection has been employed or not.]

It is best that this dose should be sufficiently large and powerful to stop and effectually control the disease for the time being. It should consist of at least two grains of opium and four of the acetate—the patient being an adult, I usually make the following prescription:—℞. Opium, 6 grs., acetate of lead, 12 grs. Mix intimately and divide into six equal parts—one, two, or three, to be given at once, according to the severity of the symptoms. After an hour, if the discharges have not ceased, another is to be given, and if they still continue, another, perhaps two, as the case may require, after each discharge, without regard to time.

By giving at first a large, or what might be deemed by some an overdose, we may, as I have often had occasion to observe, cure the disease at once, as by a blow; but if we fail in this, we are pretty sure to get, and are enabled to maintain, a perfect control over it in all its subsequent stages. It is of the utmost importance to treat the disease properly and efficiently at the outset; so thinking, we can fully appreciate the remark of Cheyne, who, speaking of the dysentery in Ireland, says, "Every successive visit more strikingly exemplified, in the helplessness of the second stage of dysentery, the infinite consequence of treating its

first stage with skill." If treated as advised, the result mentioned will be often realized.

When the discharges have been suspended some twenty-four, thirty-six, or forty-eight hours, a gentle laxative, as rhubarb and magnesia, or castor oil, with or without paregoric, may be ordered, especially if the patient feel a sense of fulness in the abdomen, or indeed any other sensation which he thinks would be relieved by an evacuation from the bowels. When the bowels have responded some two or three times to the laxative, and manifest a tendency to continue their movements, another powder should be given after the third motion, or after the second, if there be pain, or plainly indicated renewal of diseased action, in which case the dose should be repeated after each succeeding discharge.

When the disease has been arrested in the manner described, the cure may be often left entirely to nature, i.e. without even recourse to the laxative.* When this has been withheld, the first motion from the bowels is generally natural, or nearly so, and the patient convalescent. An infusion of gentian or some mild tonic completes the cure.

In the complications of fever with dysenteric symptoms, the writer's experience has led him to believe that the acetate of lead and opium, given as recommended in this paper, is the remedy which in such cases affords the most certain relief by correcting morbid secretions and controlling abnormal action.

Objections to the use of Acetate of Lead.—These grow out of the groundless fear of poisoning the patient, by inducing either colic, or that species of palsy, of which lead is supposed to be the specific cause. Having used the acetate as an internal remedy, as much perhaps as any other medical man, I can speak from considerable experience, and say that in no case whatever have I known any ill consequences follow its use; neither do I believe any will ensue if it is combined with opium, by which its action, and indeed that of each drug, is reciprocally modified by the other; consequently opium, with the acetate of lead, may be given with great satisfaction to many persons who from idiosyncracy cannot take it *per se*.

But does the acetate of lead act as a poison when given in suitable doses? Without referring again to our own experience, or that of other gentlemen, with whose practice we have been familiar, or the recorded testimony scattered through the books, we shall make a few extracts from Pereira's 'Materia Medica,' pages 664, 5, and 6, vol. 1. Speaking of the "acetate of lead," he says, "Applied to ulcers, mucous membranes, or other secreting surfaces, it acts as a desinative and astringent. It reacts chemically on the albumen of the secretions of the living tissues, and forms therewith compounds which are for the most part insoluble in water or acids. Hence the difficulty with which this salt becomes ab-

* The writer has no scruples, even when infants and children are the subjects, unless there is a manifest disposition to cerebral disease, in which case, and indeed in all, it is well and proper to watch tendencies and results. We have found cholera infantum more effectually and certainly cured by the acetate of lead and opium than by any other means or remedies with which we are acquainted. To an infant, six months old, affected with this disease, we give one-twelfth of a grain of opium with one sixth of a grain of the acetate after each discharge, up or down, more or less, or modified according to circumstances.

sorbed." A good and substantial reason why it is harmless when given as a medicine. Again, he says, "In large quantities, acetate of lead taken into the stomach acts as an irritant, and causes symptoms of inflammation of the stomach, viz., vomiting, burning in the gullet and stomach, and tenderness at the pit of the stomach; but these are usually accompanied with colica pictonum, and are not unfrequently followed by convulsions, coma, or local palsy."

"Ten grains," continues Pereira, "taken daily for seven days, caused tightness of the breast, metallic taste, constriction of the throat, debility, turgid and tender gums, ptyalism, tightness and numbness of the fingers and toes, pains in the stomach and abdomen, bowels confined." "The observations of Dr. A. T. Thompson and others (Van Swieten, Reynolds, Latham, Laidlaw, Christison), have, however, shown that injurious effects, from the use of large doses, are very rare. The acetate of lead in solution applied topically to an inflamed part we all know acts "as a sedative, astringent, and desiccative," from which properties its utility as an enema in dysentery has been inferred. Thus applied to the inflamed mucous membrane of the rectum, it seems to be a most appropriate remedy. If it has failed to produce the expected good, or has aggravated the symptoms, it is in consequence, as we believe, of having been improperly used. The principle on which it was administered, as well as the *methodus medendi*, were wrong. The usual method is to dissolve the salt in six, eight, ten, or twelve ounces of water; a quantity which distends the gut, and causes it to be applied to a large extent of surface —two things to be avoided; thus used, it produces distress and excites action; whereas, to do good and no hurt, the quantity of liquid should be small —seldom if ever exceeding one or two ounces for an adult, and for a child in proportion; and the pipe through which it is conveyed into the intestine should be quite slender, and long enough to reach beyond the internal or upper sphincter, and introduced with care to avoid giving pain or exciting the rectum to action—in order that the solution may be retained as long as possible, the patient should therefore be instructed to resist resolutely the desire to eject it. Moreover, the solution should be weak. If too strong, it will irritate the inflamed gut by its chemical properties, and do quite as much harm as when the quantity is too large. The following proportions, it is believed, will be found adapted to most cases:—℞. Acetate of lead, 6 grs., pure water 1oz., laudanum, from 30 to 50 drops, mix for an enema—to be given and repeated according to the frequency of the discharges, and retained as long as possible. In each individual case the repetition must, however, be regulated by attendant circumstances. Judging from our own observation and experience, we are entirely satisfied with the safety as well as propriety of using the acetate of lead in the manner recommended; and we cannot but think that gentlemen who will take the trouble to investigate the matter and try the remedy will arrive at the same conclusion. Admitting that it is not perfectly harmless—that now and then it produces mischief, is it more than might be justly charged to the account of some of our most valuable and valued remedies? Compared with calomel, its mischievious effects are as "a very little drop to the mighty deep."

Posture or Position.—Position and quietude of the patient are among

the most important items in the cure of dysentery. The recumbent posture should be most authoritatively enjoined and rigidly insisted on —from it the patient should not be allowed to depart, —not even when a discharge from the bowels is indispensable. The bed-pan should be used, and during its use the limbs should be kept extended—not drawn up as they usually are when that utensil is used. If the discharges are small, as they commonly are, it is better that they should be received on a folded sheet, than that either the bed-pan or *pot de chambre* be used.

Elevation of the Pelvis.—In addition to the recumbent posture, the writer is in the habit of directing, in severe cases, or those in which the tenesmus is very harassing, and the difficulty of repressing or resisting it great, that the pelvis should be raised by putting a pillow or two underneath the hips. It is hardly credible to one who has not experienced it in his own person, how much relief this simple expedient is capable of affording. Immediately after its adoption, the patient begins to feel the blood and humors flow, and even the intestines themselves rolling or swaying backward or upward from the seat of disease towards the navel, and in about an hour or two finds himself comparatively relieved.

[This posture will be found not much the less useful in the treatment of many other affections, as hæmorrhoids, inflammation of the testes, bladder, uterus, &c.; the pelvis being again lowered to a level, and then again raised when the position becomes irksome.]—*New York Journal of Medicine, July*, 1851, *p.* 34.

53.—ON THE USE OF ACETATE OF LEAD.

By William Sweeting, Esq., Abbotsbury.

[It is important that the vulgar prejudice of the poisonous nature of the acetate of lead should be exploded, and its value as a medicament established.]

Several interesting cases wherein acetate of lead has been administered in large quantities without destroying life, are recorded by Dr. Christison and Professor Taylor.

A woman was admitted into Guy's Hospital in May, 1846, having swallowed *an ounce and a half* of sugar of lead dissolved in water, from which she recovered, and left the hospital in five days.

Mr. Gorringe reported two cases in which two girls swallowed by mistake *one ounce* of the acetate, and another in which a girl swallowed one drachm, and all recovered.

Dr. Hirding gives a case in which a girl swallowed *three drachms;* she, too, recovered.

Dr. Iliff records *four* cases in which individuals swallowed each *an ounce:* and Dr. Evans one, in which *three drachms* were swallowed, and all in a very short time recovered. These cases, with the "observations and experiments of Orfila, prove that the vulgar belief that sugar of lead is an active poison, is erroneous."

The more important point to be submitted to the Association refers to

the value of acetate of lead as a remedial agent, and in treating on this subject, the result of fourteen years' experience, and the conclusions I have arrived at, are laid before you. I have found that in this substance we possess a most powerful sedative; that it is unequalled in its capability of restraining internal hemorrhages, and intestinal disturbance, and that it may be administered safely in much larger doses than were formerly supposed to be judicious. In the early years of my practice, when cases occurred in which it was deemed desirable to administer the acetate, the dose rarely exceeded one grain, repeated at long intervals, guarded, too, with opium and other adjuncts, in order to avert the injurious effects of what was popularly considered a poison, or at least the probable occasion of colic, palsy, &c.

It happened, about fourteen years since, that I was attending a gentleman's child, about seven years of age, labouring under typhus. I was summoned to him in the night, and found the child apparently sinking from colliquative bloody diarrhœa. There was no time for parleying; unless some very decided measures were adopted he would surely sink. In this emergency I administered *five grains* of the acetate dissolved in distilled water. The effect was immediate and surprising; the diarrhœa was checked, the child rallied, and at length fully recovered.

Soon after the foregoing case, two of Asiatic cholera came under my notice. To the first I gave five grains, which was speedily rejected; I then gave one grain every ten minutes. In the course of two hours the diarrhœa, vomiting, and cramps abated, and both patients recovered.

In uterine hemorrhage I have administered this medicine very largely; the following goes to prove that we have no great reason to fear mischief, either from the quantity or its accumulation:—

A woman of delicate health miscarried, and was nearly exhausted by hemorrhage, which all the ordinary appliances failed to check. On my visiting the woman, I found her pale, bloodless, the extremities cold, and apparently sinking. Having ascertained that the hemorrhage was not kept up by coagula retained in the uterus, and that the ovum had been wholly expelled, I gave her *five grains* in distilled water, and repeated it *every hour*. This was persevered in forty-eight hours. The hemorrhage was moderated, but as soon as the medicine was suspended, it returned again. I then ordered it to be taken every four hours, and continued it for a fortnight, with the happiest results, and the woman was so conscious of the benefit derived from it that she always kept a supply by her, to be taken as occasion might require. In this case, the patient took, in sixteen consecutive days, 576 grains of the acetate.

Large as the quantity before stated is, the practice is not without precedent, for Van Swieten administered *sixty grains daily for ten days*, but what the dose, and at what intervals repeated, does not appear. The largest single dose I ever administered is twenty grains. Mr. Daniel, in a paper on its effects as a remedy for mercurial salivation, states that he has "given *ten grains three times a day*, and never observed it to produce any other unpleasant symptom except a slight colic after the fourth dose."

The boldness with which I have administered the acetate, is not the result of mere speculation, nor of observations made in one month or one

year, but rather of patient and careful watching for the long period of *fourteen years*, during which time I have repeatedly directed the attention of my professional friends to the subject, at meetings of the Provincial Association, and communications with the periodicals of the day; and I aver, that during all that time I have never met with an instance in which the ill effects usually ascribed to lead have followed the administration of it.

In Professor Taylor's work is a record of a fatal case extracted from the 'Pharmaceutical Journal,' in which a child took, in small divided doses, continuously given in the space of *nine weeks, thirty-three grains*. It may not be altogether lost time to inquire whether minute doses may not have a tendency to accumulate in the system and produce its specific effects, whilst larger ones are carried out of it readily. A scruple of calomel passes harmlessly through the system; the same quantity given in small doses at certain intervals, produce violent ptyalism. There may be an analogy between these cases; the suggestion is merely thrown out for the purpose of directing future enquiry. I more than half suspect, that where acetate of lead, internally administered, has occasioned dangerous symptoms, the preparation has not been free from oxidation—it is the *oxide* which is injurious, it was that which was mixed with the cider in Devonshire, and gave a cognomen to the colic prevalent in that county. The same obtains in *painter's* colic; these people mix considerable quantities of litharge and red lead, technically called driers, with their oils, and neglecting careful ablution before taking their meals, imperceptibly swallow a material of a very dangerous character.

It has been suggested that an objection to the internal administration of acetate of lead, is its liability to decomposition by other drugs. There is much justice in the remark, reminding me that I ought to have insisted as essential, that the medicine should always be given, *simply dissolved in distilled water, without any combination whatever*. These decompositions may have been the occasion of much mischief, and hence opium, on which practitioners are used to rely as a protection, is on that account inadmissible. Care should also be taken to have the acetate very pure. The best preparation I have met with was furnished by Messrs. Preston, of Smithfield Bars, London.—*Prov. Med. and Surg. Journal, June* 11, 1851, *p.* 320.

54.—*On the Acetate of Lead.*—By Dr. Reginald Burridge, Senior Physician to the Somerset and Taunton Hospital.—[Dr. Burridge remarks that he had constant opportunities of seeing the acetate of lead employed in doses of five to eight grains, by that eminent toxicologist, Dr. Christison, and adds,]

In the year 1837 the town and neighbourhood of Taunton was invaded by an epidemic dysentery, in which the superior value of lead, in my hands, was most conspicuous. I shall not scruple to give an outline of two cases illustrative of its efficacy, and of Mr. Sweeting's main position; the one from my private case-book, the other from hospital practice.

In August, 1837, I was attending, with a very respectable surgeon of

this town, a young lady of strumous habits, who was labouring under the then prevailing epidemic, or rather, perhaps, endemic. We were summoned very early one morning with an alarm that the patient was bleeding to death, The surgeon was prevented, by a midwifery engagement, from accompanying me—a distance of three miles—but I fortified myself from his surgery with half an ounce of acetate of lead and a bottle of compound spirits of ammonia. Arrived at the house, I was shown three evacuations, the two first containing about a pint of loose coagula each, the third being a solid coagulum, about fourteen inches long, and forming a complete mould of the colon. The patient was cold and pulseless; the eyes fixed and glazed; the tongue cold, and the cold dews of death had already descended upon her. The anæmic state was very marked, including the rare and sighing, almost sobbing, respiration. In this dilemma I gave two teaspoonfuls of brandy, with a few drops of spt. ammon. co., rapidly followed by a scruple of the acetate of lead. In the meantime I had prepared a small starch enema, with a half-drachm of the acetate. Within less than half an hour the next coagulum passed, and I immediately administered the enema, and gave the second scruple of the acetate. One hour afterwards I gave a third scruple, and I had the happiness to see my patient convalesce without further hemorrhage, without any unpleasant symptom, and I can add that she is now alive, and a most useful member of society.

Later in the same year I was called upon to advise for an old soldier of the Coldstream Guards. This poor fellow passed daily large sphacelated portions of the colon and rectum, the mutilated intestine protruding through the anus in large gangrenous shreds, like the fingers of a glove. He had been treated with mercury, and finally with large doses of crude opium, without the smallest relief. Here eight grains of the acetate every three hours acted like a charm, combined with the local use, and I meet the old man now, in my daily walk to the hospital, as hale and hearty as an octogenarian can be.

I have selected these two cases, not as those in which the largest amount of the remedy has been well borne, but as those in which full doses have been followed by the happiest possible effects; indeed, during twenty-one years' ample experience of this remedy, I have never witnessed a single untoward symptom from its therapeutic use.

I have stated above that such has been the universal effect of the remedy "*in my hands,*" and I did so for this especial reason:—During the endemic of 1837, several of my professional brethren, hearing of my successful mode of dealing with it, inquired the particulars. The remedy came into general use, but produced such irritating and unfavourable symptoms, in doses of *one or two* grains, the limit to which it was then judged safe to restrict it, that it was, after a short and unfair trial, abandoned.

The only point on which I presume to differ from my old and excellent friend, Mr. Sweeting, is this—that of combination. In accordance with the practice of Dr. Christison, and the rule laid down by the late Dr. A. T. Thomson, of University College, I always give acetate of lead in a fluid form; *never* without acetic acid, and very rarely indeed without Battley's liq. opii sedativ. My large hospital and other op-

portunities have enabled me to test the relative value of lead and opium, separately and conjointly. The result has, *cæteris paribus*, determined me in favour of the combination.—*Prov. Med. and Surg. Journal, June 25, 1851, p. 357.*

55.—*Use of Belladonna in Lead Colic.*—The following plan is adopted by M. Malherbe, in the belladonna treatment: on the first day, five *centigrammes* of the extract, with ten *centigrammes* of the powder of the root. When the first dose is without effect, that is to say, when neither the pains nor the constipation have diminished, the second is composed of ten centigrammes of extract of belladonna with twenty of the powder. At last M. Malherbe has gone as far as twenty centigrammes of extract, with forty of the powder; but he has not carried the dose farther. With this treatment the greater number of patients have been relieved, from the first to the third day; in the cases in which the symptoms offered a great resistance, and could not be subdued by opium, belladonna has triumphed. Belladonna is considered by M. Malherbe as an antispasmodic, and anticonstipant.—*London Journal of Medicine, Aug., 1851, p. 721.*

56.—*Efficacy of the Male Fern in Tænia.*—By W. Cowen, Esq., Kidderminster.—[Mr. Cowen is another witness to the efficacy of the power of the oil of the male fern. His connection with the Kidderminster Infirmary has given him frequent opportunities of witnessing its efficacy, and he records the following case as one of many such instances.]

John Pearsall, age 46, weaver, states that sixteen years ago, he first discovered that he was subject to worms. From that period to the present time, this affliction has gradually increased, until he has become, from their constant irritation and annoyance, emaciated, nervous, and care-worn. He says that he has been treated by numerous medical men with more or less benefit, and has taken so much turpentine that he had rather remain as he is than take any more, although the worms often come from him as he walks.

April 7th.—Ordered him to abstain from supper that night, and take primo mane olei filicis maris, ʒj.; to be followed in an hour afterwards by olei ricini, ℥j.

8th.—Brought with him a large tape-worm, perfectly entire, and of great length, which he says he passed in about an hour after taking the castor oil.

15th.—To ascertain if more worms existed, I gave him another dose as before, but, although it acted briskly on his bowels, no trace of any worm could be perceived.

29th.—Called on him to day to know if he had passed any more worms since last I saw him, and he assures me he has not; neither has he been troubled with those uneasy sensations which formerly so plagued him. He has improved in looks, and is gaining flesh.—*Med. Times, Sept., 13, 1851, p. 282.*

57.—ON KOUSSO IN CASES OF TAPE-WORM.

By Br. Barclay.

[It seems that kousso is not the infallible remedy in cases of tape-worm which has been asserted. It is probably as successful or more so than any medicine which has been tried; but the following report by Dr. Barclay will show that it is not always successful in bringing away the *head* of the worm, and, without doing this, we might as well do nothing at all.]

On Wednesday, 10th September, 1851, Dr. Wilson admitted three patients into this hospital with tape-worm, each of which proved to be examples of the tænia solium. One man, John G., aged 31, was immediately recognised as the first patient who had ever taken kousso in this hospital, and that so recently as the month of June last. He then stated, that he had suffered from dyspepsia and sinking sensations at the epigastrium for four years, and that he had begun to pass portions of tape-worm about eighteen months before; that various remedies had been employed, and that he had been admitted into King's College Hospital in February, when kousso was administered with the effect of bringing away a very long worm, (he said thirty-seven feet). He had been already passing joints of the worm two months before he was admitted in the middle of June. A dose of the patent kousso was now administered, and a very long portion of the worm was again discharged, an exact measurement of which was not made. He began again to pass joints of the worm, two days before his admission. Savory and Moore's preparation was tried on the present occasion, and with the effect of discharging a worm thirteen feet long; but the head still remains behind, or at least was not observed among the evacuations.

John A., aged 21, was admitted the same day; he stated that he had first passed tape-worm a year and a half ago, that eleven weeks since he had taken kousso, with the effect of passing seventeen or eighteen feet of worm; and had felt comfortable and began to pick up flesh immediately after, and had continued to improve till three weeks ago, when his dyspeptic symptoms returned on him, and he was now again passing joints of the worm. A dose of the same preparation of kousso was administered, followed by a black draught, as there was no action of the bowels during several hours after, when only a few detached fragments were passed. Some days having then elapsed, in which the bowels were freely acted upon without any more portions of the worm passing by stool, a second dose of the same preparation was given on the morning of the 18th, which was followed by the evacuation of between two and three yards of tape-worm, chiefly in broken fragments, of which some portions presented very fine joints; but the head was not found. It seems useless to prosecute the attempt further, to bring away any further portion of the animal; and now, in order to restore the tone of the system generally, steel has been ordered.

The third case is that of a girl, Harriet W., aged 17, who has been suffering from feelings of sinking, and general weakness since April, and in May had passed about three yards of tape-worm, after a dose of turpentine and castor-oil, which was prescribed in consequence of detached joints having been observed in the stools. She had felt rather

better, and seen no more of the parasite until last month, during which her dyspeptic symptoms had been aggravated, and she had observed portions of various sizes in the evacuations. After a dose of the same preparation of kousso, she passed several broken fragments of tape-worm, altogether not measuring much more than a yard, among which no portions were found that approached to the head of the animal.

She seemed a person of nervous temperament, and the menstrual periods were irregular; but she began almost immediately after to complain of headache. The face was flushed, and the tongue whitish, and the pulse quick; her head was much relieved by assuming the recumbent position. A saline draught had been prescribed, her general health was much improved, and it was thought better to defer any further attempt to expel the tape-worm for the present.

There can scarcely remain a doubt in the mind of any candid inquirer that kousso is equally liable to failure with other anthelmintics in expelling the tænia solium. Neither can it be alleged that the patent preparation is more efficacious than that supplied by Savory and Moore, because, not only are we certain that the first patient took the former in June, but, from the date, it is almost certain that he took it also in February, and on the third occasion the joints were so fine that it required care to ascertain positively that the head was not attached. This was, by careful examination, placed beyond a doubt, and, unless perchance it may have been passed in a separate and detached portion which had been lost, it is extremely probable that this creature, with its extraordinary rapidity of growth, will have reached the length of some yards again in a few months.

Another advantage was said to be obtained by the use of the kousso, that it acted as a direct poison to the animal, and there was consequently the more certainty of its being expelled after its death than when the expulsion was merely due to a purgative action on the bowels; but this is also disproved, both by the circumstance that a portion has been twice left behind, which has grown again, and also by the circumstance observed in more than one of the above instances, that the detached joints continued to move for some time after their expulsion, following on a dose of the kousso.—*Med. Times, October* 18, 1851, *p.* 408.

DISEASES OF THE URINARY ORGANS.

58.—ON SOME OF THE PATHOLOGICAL INDICATIONS OF THE URINE.

By Dr. G. Owen Rees, F.R.S., &c.

[The urine, in a state of disease, must be regarded in three points of view, as bearing upon its pathological indications. We must bear in mind, that as it is presented to us, urine has passed after its secretion from the kidneys over a lengthened surface of mucous membrane, and hence its abnormal properties may consist either in an unhealthy action of the chylopoietic organs of the kidneys themselves, or of the passages over which it has flowed. Diabetes may be taken as the type of fault in

the chylopoietic organs; albuminuria as from a diseased condition of the kidney; while cystitis may be looked to as an example of the changes produced upon the urine by disease of the urinary mucous membrane, and to certain forms of alkaline and purulent urine unconnected with lesion of the secerning structure of the kidney.]

The indications of the urine consequent upon chylopoietic disease, and also those caused by disease of the secreting portion of the kidney, are often simulated by the indications afforded when the mucous surfaces over which the urine flows are alone in fault; the urine being secreted in a healthy state by the kidneys, but being discharged from the urethra greatly altered from its healthy condition. Let us take as an instance of this a form of phosphatic urinary deposit which occasionally appears as indicative of dyspepsia,—the monobasic triple phosphate. An alkaline or neutral urine depositing these crystals may pass from the urethra simply in consequence of the existence of irritation of the mucous surfaces of the kidney, ureters, or bladder, but may have been secreted quite healthy, and of its normal degree of acidity, by the secreting portion of the kidneys. Again, the urine may contain albumen in consequence of disease of the bladder or ureters, causing purulent secretion, while the kidneys may be healthy, and the urine thus vary from its normal character only after it has left the pelvis of the organ. Here, on the one hand, the urinary indications might be considered indicative of dyspeptic mal-assimilation, or on the other, of important change in the kidney, whereas the whole mischief might lie in inflammatory disease of the mucous surfaces over which the urine flows after it has left the cortical portion of the organs. It is often, then, highly important, when any abnormal condition is detected in the urine, to ascertain by careful examination, and notice of other symptoms, how far the change from health has been brought by the influence of the mucous surfaces.

[What action do the mucous surfaces exert upon the kidney? what do they add to the secretion? and in what way do they modify its character? In health, the urine receives from it epithelium in small proportions, more or less altered in form, and mucous corpuscles. These are found in all urine, and may be easily seen as a cloudy deposit by a bright transmitted light. Although protection to the mucous membrane is one of the uses of mucus, it has besides a chemical quality, which is valuable, and perhaps too little regarded, viz. its alkalinity.]

Now, healthy urine is nearly always acid, and this amount of acidity is constantly varying, the secretion becoming at one time neutral, or even alkaline, and at others far above the average degree of acidity. This points to the necessity for a mucous surface capable of pouring out its alkaline secretion freely, and, if necessary, suddenly and in large quantity, and this always happens when irritation is set up, or inflammation produced, in the mucous membrane.

You are all familiar with the secretion which flows from the nose at the commencement of catarrh, and also from the bronchi in some inflammatory conditions. This is a watery secretion from the mucous membrane, and it possesses a strongly alkaline reaction. The discharge will amount to as much as several pints in the course of the twenty-four

hours in some cases of bronchitis. In like manner the mucous membrane of the bladder will throw off under irritation an alkaline fluid more or less clear and watery.

I had occasion some five or six years ago to observe this in the case of a man whose anterior abdominal parietes were deficient. As is usually the case in such persons, the anterior portion of the bladder was also wanting; so that the fundus of that viscus, covered by mucous membrane was projected forward where the abdominal walls were deficient. The openings of the ureters were thus presented to view. The mucous membrane was red and inflamed from exposure, and an alkaline fluid was constantly discharging from its surface. To what this alkaline flux amounted during the day, it was, of course, impossible to ascertain; but it was more than sufficient to destroy the acidity of the urine, which was quite alkaline after flowing over the membrane. Thus, if a piece of blue litmus paper was applied to the openings of the ureters so as to test the urine, immediately it flowed from them the paper was reddened, indicating that the urine was secreted of its natural character, and with its full amount of acidity. When, however, the litmus paper was applied about a quarter of an inch below the opening, so as to test the urine after it had passed over that short distance of mucous surface, its characters were quite changed; it no longer reddened the blue litmus paper, but, on the contrary, was sufficiently alkaline to restore the blue colour to those parts of the paper which had been previously reddened by exposure to the urine as it escaped fresh from the ureters. Let us apply this experiment in considering the pathology of alkaline urine, and we must at once admit that disease of the mucous surface is a sufficient cause for the production of this indication.

With respect to alkaline urine generally, it may be stated that whenever it is excreted it is attributable to one of the following conditions:—

1. Disease of the spine from injury or other cause.
2. Dyspepsia.
3. Disease of the urinary mucous membrane.

And 4. The ingestion of medicines, or of aliments containing alkaline salts or salts of vegetable acids.

A fifth—viz., the discharge of an excess of soda, or potassa, or ammonia, from constitutional causes—is mentioned by Dr. Prout. This, however, I am now satisfied must be regarded as produced by aggravated disease of the mucous surfaces, and therefore should be included under the third heading.

I will proceed to consider these conditions seriatim.

First, then, when disease attacks the spinal column, the cord becoming subsequently affected; or when, from external violence, the nervous centre suffers immediate injury, the urine will become alkaline. Various theories have been resorted to in order to explain this. That the secretion of the kidney may become changed owing to disease in the neighbourhood of those nerves of organic life from which it derives its energy, no one will be prepared to deny; this may possibly happen; but there is much to lead us to suspect that another cause than this has the principal share in bringing about an alkaline condition of the urine. I allude to an increased action of the mucous surface, probably brought

about in order to protect the ureters and bladder as much as possible during the passage of acid urine over them. The membrane which in its healthy state could bear the stimulus of the healthy urine has now partly lost its vitality, and an alkaline fluid is secreted for its defence. The view I have here taken is strongly borne out by what we observe in all affections of the spinal column terminating in disease of the medulla spinalis and its membranes. The urine first becomes alkaline; as the disease advances, large quantities of mucus appear; and post-mortem examination of the urinary organs will show an aggravated disease of the mucous membrane lining the pelvis of the kidneys, the ureters, and bladder.

[With regard to the relation here shown of alkaline urine to spinal injury, Dr. Rees points to the propriety of using *alkaline* and demulcent remedies in such cases for the relief of the urinary symptoms.]

Secondly, with respect to the alkaline condition of urine caused by certain forms of dyspepsia. This, which is accompanied with the deposit of the earthy phosphates, has been regarded by Dr. Prout as indicative of a tendency to the waste of nervous matter, and a general debility of constitution; and it is certainly true that we generally meet with it in those who have been overworked, either mentally or physically. There is a point of view, however, in which this form of urinary disease has not been regarded, but which yet seems to bear strongly on its pathology.

Now the researches of Liebig have shown that the gastric juice in all probability owes its acidity to the same acids as those which enter into the composition of muscular structure—viz., the phosphoric and lactic; and from whatever source these acids may be derived, it is certain that their proportion in the urine is governed by the necessity there may be for their expulsion from, or detention within, the organism for the discharge of the functions of life.

The constitution of the urine is such, that its degree of acidity (taking the whole result of twenty-four hours) may, to a certain extent, be regarded as the measure of the acidity of the stomach, or of the quantity of the phosphoric and lactic acids expelled, and this would seem to point to the deficiency of acidity in the excretion as an indication of disorder of the stomach interfering with the secretion of the gastric juice in its healthy condition. I believe this alone to be the cause of alkaline urine, so far as what are called constitutional causes are concerned; and I do not believe the deposit of phosphates, when it occurs in alkaline urine without disease of the passages, to indicate any thing more than this state of stomach. Under these conditions the urine is, of course, secreted *alkaline by the kidneys*, and is not, as in disease of the passages, *rendered alkaline after secretion*. This alkaline or neutral state may, if you please, be regarded as indicative of nervous action being defective, and secretion of the gastric juice not going on as it should do in consequence. Whatever view we may take, however, we must regard the disease as more immediately the consequence of a mal-secretion on the part of the stomach, probably caused by the circulation of a diseased blood through the structure of the organ.

With regard to the term, "phosphatic diathesis," I do not consider

that the deposit of the earthy phosphates is any thing more than an indication that the urine is neutral or alkaline. The deposit of these earthy salts has led to the erroneous idea that they are present in *excess*, and to the adoption of the above term. There are few diseases, however, in which the earthy phosphates are really present in excess, and these are not allied in any way to the class of cases which come before us as urinary diseases. Thus the urine is often *acid* when large quantities of earthy phosphates are escaping, as in mollities ossium.

I am by no means inclined necessarily to connect alkaline urine with severe nervous irritation, with wasting, and other symptoms of vital decay. Many cases in which we observe the secretion of such urine with phosphatic deposits show no such condition, the debility not exceeding that which characterizes many forms of dyspepsia; while, on the other hand, we often see great depression and loss of vital power, with wasting, as when oxalate of lime appears, and no tendency to alkalinity.

With respect to the treatment of that morbid state of the system which induces the excretion of this kind of alkaline urine, the administration of the mineral acids is by far the most valuable means we possess of restoring the stomach to its healthy function. In many cases this alone will be sufficient, if continued for a few weeks; but in old cases, or where relapse has been frequent, it is highly desirable to have recourse to mild alterative treatment in addition. For this purpose nothing can be better than the use of the bichloride of mercury in small doses, taken at bed-time in the form of draught, and in combination with the tinctures of rhubarb and bark. This will be found greatly to assist the mineral acids in restoring the healthy secretion of the stomach. The bowels should be closely watched in this disease, and their action kept up by warm stimulating purgatives.

I shall now proceed to consider that alkaline condition of urine which is connected with disease of the mucous surfaces lining the kidney and ureters, and in which the urine is secreted acid, but becomes alkaline in consequence of the changes subsequently effected in it. Here in addition to the alkalinity of the urine, we have symptoms not so much characterised by dyspepsia as by irritation of the urinary canals. There are dull pains in the loins, and down the sides of the abdomen, occasional dysuria, and not uncommonly the skin becomes inactive and dry, or subject to occasional excessive excretion. The urine generally contains mucus in excess, and sometimes pus in considerable quantity; and in the older and more aggravated forms of the disease the miseries consequent on calculus in the bladder are often added to other evils.

It has been believed up to the present time that when urine has been secreted acid by the kidney, and has subsequently become alkaline, owing to the action of the mucous surfaces, the cause of the alkalinity consists in the evolution of carbonate of ammonia, produced by the decomposition of urea. The mucus poured out by the mucous membrane has been regarded as a sort of ferment; and by its action carbonate of ammonia has been supposed to be formed by a disturbance in the arrangement of the elements of urea. Now, though it is nearly certain that the urea undergoes this kind of decomposition when the urine is long retained in the bladder or urinary passages, it is highly improbable that

such decomposition always takes place in the cases I am speaking of; and I think I shall be able satisfactorily to prove to you that we have no occasion to resort to such mode of explanation. If we take healthy urine of its full acid reaction, and add liquor potassæ to it carefully, we shall find that when we have neutralized its acidity, ammonia is immediately evolved. There is no occasion to use caustic alkali, however; for if we add a solution of basic phosphate of soda instead, which is a very mild form of alkaline solution, we still observe that ammonia is given out in great quantity. If we now test the reaction of this urine, we find that the reddened litmus paper becomes blue, indicating the presence of an alkali; but on drying, it will again assume its red colour, showing that the alkaline reaction was caused by ammonia, and not by fixed alkali; but, it may be asked, how could this happen, since we used *fixed* alkali to produce the alkalinity? The fact is, that our fixed alkali is all neutralized by the acids with which the ammonia was previously combined, and the volatile alkali is set free to exercise its power on the reddened litmus. Thus, supposing the ammonia to have existed as phosphate and hydrochlorate in the urine, the fixed alkali has combined with the phosphoric and hydrochloric acids to form *neutral* salts of the fixed alkali, leaving the ammonia the only free alkali present. So it is that the mucous surface will occasionally act under inflammation: the alkali contained in the mucous secretion is fixed alkali, but its presence produces free ammonia, while the fixed alkali itself is neutralized to form salts with the acids which were previously combined with the ammonia. This state of things will always be observed when the mucous surface is not pouring out any very large quantities of its alkaline secretion. When, however, there is an excessive discharge of alkaline fluid, then there is a change with regard to the action of reddened litmus, which will now become permanently tinctured blue. No drying will restore its red colour, and we therefore at once observe that fixed alkali effected the change. This has happened owing to the excess of fixed alkaline matter poured out by the mucous membrane having more than neutralized the acids of the ammoniacal salts contained in the urine. All the ammonia has been set free, but the fixed alkali has been secreted in such great quantity as to neutralize both the free acid of the urine and the acids of the ammoniacal salts. I would particularly beg your attention to this circumstance, as important distinctions connected with general pathology have been made in reference to these two conditions; whereas I firmly believe there is no necessary difference whatever *in kind* between the two states, and that they are always merely differences in degree of inflammation of the mucous surface. It is a fact, then, that urine may be rendered fugitively alkaline (that is, alkaline by free ammonia), and also permanently alkaline by the action of the inflamed mucous membrane, and that one or the other state may be induced according as the membrane pours out more or less alkaline fluid. Attempts have been made by systematic writers to draw a distinction between these two conditions, founded on the nature of the phosphatic deposits accompanying them. This has greatly confused the subject; but, if you will only regard the matter as I would now wish to place it before you, I think much of the difficulty will be overcome.

The earthy salts of the urine—viz., the phosphates of lime and magnesia—always appear in the form of urinary deposits when the urine becomes alkaline. When the urine deposited the triple phosphate (or phosphate of ammonia and magnesia), Dr. Prout was inclined to consider the case as somewhat different in kind to that in which both the earthy salts appeared—that is, when the phosphate of lime accompanied the triple phosphate. It will be obvious, from what I have told you concerning the fixed alkaline matter contained in the secretion of the mucous membrane, that, if that alkali be poured out only to such degree as to evolve ammonia, and not to neutralize the whole of the acids of the ammoniacal salts of the urine, the triple or ammoniaco-magnesian phosphate must be thrown down as a deposit. If the alkali be effused by the inflamed membrane in still greater quantity, then it is obvious the phosphate of lime must also fall; the mischief in both cases arising from one and the same cause—viz., inflammation of the mucous surface. Now, if we look to Dr. Prout's work, we shall find the history and symptoms detailed under these heads exactly such as we might expect from varying degrees of inflammation of the urinary canals; and it is a matter of surprise that the power of that membrane in rendering the urine alkaline, and its necessary influence in producing the various phosphatic deposits, has been so much overlooked as it has been by systematic writers. When, then, you observe urine of alkaline reaction, always ascertain whether or not it affects reddened litmus or turmeric paper permanently. If it do not, and the paper reassume its colour on drying, then ammonia has changed it; and you may conclude, with considerable accuracy, that the mucous membrane is not in so inflamed a state as when a permanent effect is produced. In the one case you will generally have the triple phosphate only as a deposit; in the other, you will have the phosphate of lime also. Of course, it is necessary for you here to exclude from your consideration that form of alkaline urine which I have before noticed, and which is *secreted* alkaline, and is characteristic of dyspepsia. I am now merely speaking of alkaline urine as produced by the action of the mucous surfaces. There is seldom, however, much difficulty in making the distinction between these two kinds of urine. That characteristic of general disorder, and which is *secreted* alkaline by the kidney, is very rarely accompanied with more than the normal amount of mucus; whereas urine which is made alkaline by the action of the mucous membrane nearly always contains mucus and epithelium far beyond the quantity observed in health, and very often pus also.

The disease characterised by the deposition of the mixed phosphates (that is to say, both the triple phosphate and phosphate of lime) is very accurately described by Dr. Prout. He states that it seldom occurs without severe and old disease of the bladder and prostate, which, you will observe, is precisely the condition that would favour the discharge of large quantities of fluid from the mucous surface, and so bring about an alkaline urine, such as would permanently affect the test paper.

I must now direct your attention to that state of urine which has been described by Dr. Prout as consisting in an excessive excretion of the alkalies. This affection, which that great authority was inclined to consider peculiar in character, was observed by him only in very advanced cases

of disease, where the bladder and mucous passages had suffered greatly, or where calculus or what he called long-continued phosphatic diathesis had greatly lowered the patient. From what I have already urged upon your attention, I think you will now be prepared to believe that a very simple explanation may be given of this condition. I have already alluded to two states of the urinary mucous surfaces: in one of them the fixed alkaline fluid was poured out merely in quantity sufficient to liberate a part of the ammonia from the ammoniacal salts; in the second, the fixed alkaline fluid from the mucous membrane overcame the acids entirely, and communicated a permanent alkalinity to the urine when secreted. The first of these conditions was accompanied chiefly by a deposit of the triple phosphate; the second, by both the triple phosphate and the phosphate of lime. Now when long-continued or aggravated disease, such as Dr. Prout has so well described, affects the urinary passages and bladder, and a condition of urine is produced in which ammonia and soda (and, as he states, probably potassa) are found in excess in urine, the cause of the presence of these constituents appears very plainly indicated. I believe, then, that this condition is again produced merely by an inflammation of the urinary mucous surfaces connected with a more excessive discharge of their alkaline secretion; and that it is the constituents of this which, by their presence in such excess, decompose the ammoniacal salts, throw down precipitates of the earthy matters, and, becoming free, produce the form of urine described by Dr. Prout. I in no way believe the disease to be caused by any peculiar state of system.

It will be observed that I have here extended the importance of the alkaline secretion of the urinary mucous surface to a degree which has not yet been accorded to it. I would wish to state, however, that I have only done so after very mature consideration, and a full persuasion of the very satisfactory manner in which this view explains and simplifies the subject. The discharge from an inflamed mucous surface, when we have the opportunity of exactly estimating it, we all know to amount to a very large quantity per diem. This discharge is a fertile source of alkali; and there can be no possible reason why the urinary mucous membrane should be exempted from liability to excessive secretion any more than the lining membrane of the bronchi or nares. It is, as I have before said, constantly exposed to the action of a fluid which is varying in its degree of acidity, and which is affected by the character of the ingesta; and there is no occasion that I should explain how or why it is that, in our civilised state, those ingesta are most irregularly supplied to the stomach, both in quantity and quality; or how we too often find the members of our enlightened community paying dearly, through their urinary organs, for those physical as well as intellectual delights which are to be obtained at the dinner-tables of the more elegant and refined of the age. There is, perhaps, no mucous surface more harshly dealt with than that lining the kidneys, ureters, and bladder, and none which has been less reasoned upon by pathologists.

You will observe that I have taken especially into consideration the action which the fixed alkali poured out must exercise on the ammoniacal salts of the urine; whereas the production of ammonia in urinary

disease has been previously ascribed to the decomposition of urea only. I by no means, however, entirely disregard this last-mentioned source of the alkali; it is well known, indeed, that some portion of urea is always decomposed when brought in contact with fixed alkaline solutions.

The analogy to which I have pointed, in comparing the secretion of the urinary mucous surface under inflammation with the products of other mucous membranes in the same condition, may not at first appear quite satisfactory. It might be very plausibly argued that the condition of membrane under which the greatest amount of secretion was poured out was not necessarily that of highest inflammation; and from what we know with respect to bronchitis, it must be acceded that, when the secretion is produced very alkaline, and very fluid, and in very large quantity, we do not always find that inflammation runs highest. It is under this impression that I would rather apply the word irritation, when speaking of these varying amounts of secretion, believing, as I do, that it more correctly expresses the real and immediate condition. Thus. when the system is broken down by old and long-continued disease, it is then we observe the presence of the fixed alkalies in excess in the urine; or, in other words, we have then large quantities of the mucous fluid poured out; and it is this kind of excessive discharge which is produced in the bronchial tubes when the patient shows no great power of system, where irritability exists, and where inflammatory action is marked by that degree of atony which the practitioner recognises in the term "subacute inflammation."

With respect to the treatment of these cases of alkaline urine, it must be of a very different kind from that which is applicable to the cure of alkalinity of the urine when caused by stomach derangement. The pathology of the subject must be regarded, and the alkalinity combated by directing treatment to the irritated mucous surfaces. We must remember that the urine is secreted acid, and our object must be to make it less irritating. The acid remedies which are useful, therefore, in that form of alkaline urine dependent on constitutional causes, are here most improper; and we must meet these diseased conditions by the exhibition of alkalies. The urine as it is secreted in the kidney, must be rendered alkaline, and so less irritating; and while we do this, attention must be paid to the state of the secretions generally, and especially to that of the skin,—a much neglected excretory surface, but which should never be forgotten in considerations connected with urinary pathology.

I am well aware that, in the case of the excretion of alkaline urine such as I here describe, high authorities have recommended the use of acid remedies. I entirely differ from this view; I believe it to be inconsistent with sound pathology, and experience has shown me the advantage of the opposite plan of treatment.

With respect to the best means of rendering the urine alkaline and less irritating in this disease, I would recommend the use of salts of vegetable acids: the citrate of soda or potassa, as exhibited in ordinary saline draughts, is an excellent salt for the purpose. This is more especially to be used when it is not desirable to risk purging the patient; when, on the other hand, we find it requisite to produce such effect,

the tartrate of potassa may either be substituted, or combined with the citrate.

The vegetable acids are decomposed in the organism, and the base with which they were combined appears in the urine as a carbonate. If the state of the bowels be such as to require purging, there is no better remedy than the ordinary Seidlitz powder of the shops—a combination of soda and potassa with the tartaric acid which rarely fails to induce an alkaline state of the urine, and thus soothe the irritation of the canal. This treatment, if combined with the use of vegetable tonics, will be found sufficient in early cases. Where, however, we have to deal with cases in which there is evidence of old and long-continued disease, we must not trust to this treatment alone. We may here expect that thickened state of the submucous cellular tissue consequent on inflammatory action; and we must have recourse to mild alteratives and sedatives, and remedies such as will assist the skin to assume a more than ordinary action for the relief of the kidneys; hydrargyrum cum cretâ and Dover's powder, in small doses taken at night, may be here used with great advantage. Care must be taken, however, to watch the effects of the mercury, —to ensure, in fact, its alterative action, and to avoid alike both purging and salivation. In the cases Dr. Prout has described as characterised by the presence of the alkalies in excess, mercury is nearly always inadmissible; the patient is generally too far debilitated to admit of its exhibition with any degree of safety, and support, antacids, and sedatives, are all we dare venture upon.

In all these conditions a great amount of relief may be obtained by the use of warm bathing, if it be judiciously applied. In advanced cases the debility is generally too great to admit of it; but wherever the strength allows it, the use of warm or tepid baths, and of friction to the skin, are valuable means of relieving the patient.

An excellent method of rendering the urine less acid and irritating in all these forms of disease consists in the administration of the liquor potassæ. This is, indeed, the old established and favourite remedy which experience has approved; I have constantly used it, and in some cases it is an extremely efficacious and convenient form of alkali. Owing, however, to the small quantity of potassa which we may venture to exhibit in the caustic state, the urine is not rendered alkaline by this remedy so speedily as when the tartrate and citrate of the base are used. I must here state a fact which has been brought to light by this mode of treatment, and which places it beyond doubt that the urine is secreted *acid* in these cases of *alkaline* urine. Now if we begin in the early stage to exhibit small doses of liquor potassæ,—say from 15 to 20 minims, three times a day,—we shall occasionally find that, while this *alkali* is being exhibited, the urine which was alkaline will become *acid*.

You are now prepared to understand how this may happen. If we lessen the acidity of the urine as it is secreted on the mucous surface, and thereby rendering it less irritating, that surface will in time recover itself, and no longer pour out that fluid, which is the result of inflammation. The urine will after a time pass over it without producing irritation, and the result will be that acid urine is voided, its natural acidity being only partially neutralized by the small dose of liquor potassæ. I

perceive this to be the only satisfactory explanation of the fact, so anomalous at a first view, that *alkaline* urine may be rendered acid during the administration of an *alkaline* remedy.

I will now say a few words respecting the last heading,—namely, that which refers to the alkaline state of the urine produced by the ingestion of medicines, or of aliments containing salts of vegetable acids.

I need not here stop to consider the effects of the pure or carbonated alkalies, when used medicinally; and I have already explained that the medicinal alkaline vegetable salts are decomposed in the organism, so as to afford carbonates of their bases in the urine. I must, however, refer to the effects of some articles of diet which are occasionally capable of rendering the urine alkaline, and which, therefore, may perhaps occasionally produce some anxiety amongst those who are morbidly inquisitive and sensitive as to the state of the secretion.

It will be obvious that, since it is our object to render the urine alkaline and less irritating, as it is secreted by the kidney, in those cases of alkaline urine which are dependent on irritation of the mucous surfaces, those ingesta which produce the alkaline condition must to a certain extent assist us in treatment. This state of things is brought about by the digestion of all sub-acid fruits. It was remarked by Rousseau, who suffered from calculous disease, that he always got relief during the strawberry season, the fruit exercising a favourable influence on his symptoms. This result was brought about by the conversion of the acids into carbonic acid and water; the base with which they were combined passing into the urine in the form of carbonate. But it is not only sub-acid fruits which effect this: potatoes taken in quantity will produce a similar result, and thus an excess of that vegetable may become a cause of alkaline urine. I ascertained this fact by experiment, some two or three years ago, on a gigantic Irishman, whose stomach was capable of receiving, if not digesting, seven pounds of potatoes at a meal. Potatoes contain alkaline salts of both the citric and malic acids, and it is to these they owe the property of rendering the urine alkaline. Sub-acid wines, especially champagne, taken in quantity, are also capable of producing alkaline urine. It is important you should be aware of this, as alkalinity may be looked upon as a sign of rapid decay of vital power in cases of extreme debility or exhaustion after operations, whereas it may be owing merely to the support we are affording the patient in the form of champagne. I have known this to occur, and it produced some anxiety until the real cause of the alkalinity was detected. A glass of champagne every four hours exhibited to a person worn by disease, and whose stomach refuses solid aliment, will generally render the urine alkaline in twenty-four hours.—*Med. Gazette, July* 4, 1851, *p.* 29.

59.—REMARKS ON ACID AND ALKALINE URINE.

By Dr. H. Bence Jones, F.R.S., &c.

One of the most remarkable characteristics of urine is the re-action which it always presents to test-paper. If the whole quantity of urine passed in the twenty-four hours be collected and examined, it will give an

acid reaction. If the water passed at different hours of the day is examined, then the degree of acidity will be found to be always changing. So that there is no one constant permanent degree of acidity of the urine. It is as varying as is the state of the acidity of the stomach. It may be said, generally, two, three, or more hours after food is taken, the quantity of acid in the stomach attains its greatest height. The food then begins to be absorbed, or to pass out through the pylorus, when the acid begins to diminish, until the stomach is again empty, when it returns to a neutral or a slightly alkaline state.

In the 'Philosophical Transactions' for 1849, Part II., you will see some elaborate diagrams, showing the effects of different diets on the acidity of the urine,—different lines, showing respectively the effect of animal food, vegetable food, mixed diet, and abstinence from all food. From the time when food is taken, the acidity of the urine begins to descend; and after two, or three, or more hours, the acidity is at its lowest point. Thus, at the time when the acidity of the stomach is at its highest, the acidity of the urine is at its lowest point. Frequently, indeed, the acidity of the urine is so low, that it passes the neutral state, and becomes distinctly alkaline; and this may occur in healthy persons, whose stomachs are slightly irritable; certainly it does occur in those who are not subject to any disease which seriously interferes with the process of digestion. After two or three hours it is found that the acidity of the urine again increases, rising at first rapidly, then more slowly, until the period when food is again taken, when it again begins to fall. Thus you will see that, as regards acidity, there is an inverse relation between the state of the stomach and the state of the urine. I have shown you the acid reaction of the gastric juice after food has been taken; now let me show you the reaction of the urine as regards acidity, before and after food. I have here four different specimens of urine, passed at different periods of the day. The first was passed just before food, and on examination, it will give a decidedly acid reaction: it was passed just before breakfast, by a healthy person. Here is the next specimen, passed three hours after breakfast was taken; you see that there is scarcely any acid reaction; it was passed by the same person. The third specimen was passed two hours after the second; and you see the acidity distinctly returning. The fourth specimen was passed two hours later than the third, and the acidity is very much more evident,—closely approximating, indeed, to that of the first specimen. (Experiment with test-paper). The mode that I have adopted for marking these variations of the acidity of the urine, (for the test-paper is not sufficient to determine the actual degree of these variations), is the following: I have here a tube, graduated into a hundred measures. Pure carbonate of soda is dissolved in so much water, that every measure of this tube contains the twelfth of a grain of carbonate of soda. This forms a test alkali. I have a test acid prepared in a similar way, one measure of the tube containing as much acid as will saturate the twelfth of a grain of carbonate of soda. I then take a 1000 gr. bottle and weigh the bottle full of urine, and pour it into a little basin, adding the test alkali or acid, while the basin is constantly stirred and gently heated, until I bring it to the point of neutrality. Thus the number of measures of test

alkali required to effect the neutralization, gives the quantity of carbonate of soda which will neutralize the acidity of the urine. I find that this is usually much greater in urine passed just before food than in that passed two or three hours after food. I find even, sometimes, that test acid has to be added to the urine which is passed after food, to bring it back to the neutral state. By this method we obtain a sufficiently exact measure of the alkalescence or the acidity of the urine; and it is thus tables may be constructed:—

(No. 1.) *Variations of Uric Acid and Acidity.*

Mixed Diet.	Specific Gravity.	Per 1000 grs. Urine Uric Acid.	Per 1000 grs. Urine Acidity.
Urine at 2 p.m.	1025·0	... 0·52 grs.	... 13·07 meas.
Dinner at 7 ,,	1025·7	... 0·12 ,,	... 26·12 ,,
11 ,,	1026·7	... 0·62 ,,	... 13·81 ,,
Vegetable Food.			
at 2 p.m.	1021·6	... 0·56 ,,	... 8·29 ,,
Dinner at 6½ ,,	1024·0	... 0·05 ,,	... 26·36 ,,
10½ ,,	1026·2	... 0·64 ,,	... 3.29 ,,
6½ a.m.	1034·2	... 0·66 ,,	... 19·52 ,,
Animal Food.			
2½ p.m.	1022·7	... 0.24 ,,	... 7·82 ,,
Dinner at 6½ ,,	1024·8	... 0·05 ,,	... 21·46 ,,
11½ ,,	1029·9	... 0·77 ,,	... 16·50 ,,

My table, in the third column, represents the number of measures of test alkali required to neutralize 1000 grains of urine passed at different times, and when various diets were taken. I was induced to follow out these variations, from observing the action of the urine on test paper, in urine precisely similar to that which you have seen me test a few minutes since. Before breakfast, the reaction was highly acid, while, in the water passed after breakfast, the reaction was alkaline; and in a few hours afterwards the secretion was highly acid again. I found, that by making careful examinations, the same variations followed, meal after meal, day after day, and for days together.

To determine whether these variations in the acidity of the urine were really caused by variations in the acidity of the stomach was not difficult, for this reason: if these changes depended on the state of the stomach, it was very clear that, by allowing the stomach to remain unacted upon by food, provided no acid was secreted in the stomach, no great variation in the acidity of the urine ought to be found. During fasting, none of those changes which are apparent in the urine when food is taken, ought to occur. Thus, by simply abstaining from food, I tested whether the variations of the acidity of the urine were really produced by the variations of the acidity of the stomach or not.

It was found that, when perfect abstinence was observed, scarcely any change took place in the acidity of the urine, when the specific gravity of the urine was not materially changed. After ten or twelve hours, food was taken, and instantly the acidity of the urine fell, and, in the course of a short time, was below the neutral line. No more accurate test of the influence of the stomach could be applied than this. Nothing can be more evident than the intimate relation which exists between the state of the stomach and the state of the urine.

Let me point out one or two other results which I obtained when examining the variations in the acidity of the urine after different kinds of food were taken. I found (contrary to what might have been supposed) that, when animal food alone was taken, the quantity of test acid required to render the urine neutral after such food, was greater than when vegetable food was taken; that is to say, that the acidity of the urine after animal food, is less than after vegetable food. Supposing it to be true, that at any one period of the day the acidity of the stomach is inversely proportioned to the acidity of the urine, this would show, that vegetable food does not cause so much acid to be thrown into the stomach, as is caused when animal food is taken. I have mentioned, that the acidity of the gastric juice is the effective agent in dissolving albuminous food; perhaps a less remote cause may be found in the following statement:—When food is taken into the stomach, the acid is poured out there. Of this acid I have already spoken, and have shown you that some portions of it consists of hydrochloric acid, and, probably, of phosphoric acid. If hydrochloric acid and phosphoric acid are set free in the stomach, there must be some decomposition of chloride of sodium or phosphate of soda. If acid is poured out in the stomach, alkali must be set free somewhere else; and it seems to me most probable, that the hydrochloric acid is set free in the stomach, whilst the soda (the alkali) remains in the blood; so that, during digestion, the blood is more alkaline than it is at other periods. If the blood is in a more alkaline state, then the secretions which take place from that blood ought at that time to become more alkaline. You will remember, in my lecture on the saliva, I mentioned, that Dr. Wright, of Birmingham, observed, that the saliva was more alkaline during digestion than at other times. So, also, according to my own experiments, the urine is at this time more alkaline than at other times; so much so, that sometimes during digestion, the urine is so alkaline that it requires as much as 30 measures of the acid solution, equivalent to $2\frac{1}{2}$ grains of carbonate of soda, to render 1000 grains of urine neutral.

Having satisfied myself as to the variations in the acidity of the urine, it became an interesting point to determine what was the effect of different medicines. But my time will not permit me to enter fully into this subject. I must refer you to the two papers in the 'Philosophical Transactions,'—one in 1849, and the other in 1850—which give the results of experiments during one day on which no medicine was taken, three days on which the medicine was tried, and then a fifth day on which no medicine was taken. Thus, by means of these five days' experiments, I have attained a pretty tolerable certainty regarding the effect of different medicines upon the acidity of the urine. I may say, that the medicines that were tried were sulphuric acid and tartaric acid; and, to see the effect of alkalies, caustic potash, carbonate of ammonia, tartrate of potash, and tartrate of ammonia were made use of. These substances were prepared with considerable care, so as to insure that there should be no interference in consequence of any impurity being present in them. The most interesting result of all, and the only one on which I shall now dwell, was the comparative effect of tartrate of potash and tartrate of ammonia. It was well known, and stated by many

authors long before I commenced these experiments, that tartrate of potash caused the urine to be alkaline. I found that it did so; but I found that it caused it in a different way from what had been stated by the authors who had made experiments on the subject.

[Dr. Bence Jones here introduces a table showing the variations i the acidity of urine when tartrate of potash and tartrate of ammonia were given; and then goes on to say:]

The undotted line in my woodcut represents the effect of tartrate of potash, and at first sight it is evident that the line which represents the state of the urine is much lower than that which marks the variation when tartrate of ammonia was taken. Let us trace this undotted line a little closer. It commences about breakfast time, soon after which it passes the neutral line, showing that the urine then was alkaline; about two it rises, recrosses the line, and then, when the urine had become acid, a dose of five drachms of tartrate of potash was taken, and almost immediately the line descends in consequence of the urine becoming alkaline again. It does not remain so for any length of time, for very rapidly the line descends to its lowest point, and then rises again above the neutral line, and ascends almost as high as it would have done if no tartrate of potash had been taken. You might suppose from this, that the effect on the urine was ended; but it is not; for look at the undotted line. When dinner was taken the highest point had then been reached, for after food the line descends, and it reaches a point some hours after food far lower than it probably would have reached if no tartrate of potash had been taken. Thus, it may be said, the tartrate of potash does not interfere with the variations produced by the state of the stomach, except that a short time after it is taken it renders the urine alkaline, and that the effect of the tartrate of potash becomes again apparent when it afterwards acts with the state of the stomach; then it renders the urine more alkaline than it otherwise would have been. I repeated the experiment on the succeeding day with three drachms of tartrate of potash, the effect of the previous dose still continuing. After breakfast, the line marks the alkalescence of the urine. By twelve o'clock the acidity rose, and reached by two o'clock to a high degree. Then the three drachms of tartrate of potash were taken,—a smaller dose than before,—but almost immediately the urine became alkaline again. But this was not permanent, for the acidity soon began to rise again, until dinner was taken; then the medicine again showed its effect when it was acting in conjunction with the alkali left in the blood, by the acid going, for the purpose of digestion, to the stomach. On the third day, a repetition of the tartrate of potash caused the same alternation to take place, though the dose then was two drachms. I found that 120 grains of tartrate of potash caused an immediate effect on the acidity of the urine, rendering it alkaline in thirty-five minutes; but that this first effect passed away quickly. This accounts for the statement made by one author, that tartrate of potash does not make the urine alkaline. The real fact is, that the first effect lasts only for a short time, and that you must look for its greatest effect when it is acting in conjunction with, and not in opposition to, the state of the stomach,—in

other words, the effect of the tartrate of potash will be greatest when acid is secreted in the stomach, and the effect will be least when the acid is passing out of the stomach; and it is not improbable, that then it might be altogether overlooked.

Having traced the effect of tartrate of potash, look at the dotted line, which shows the effect of tartrate of ammonia. The first day two drachms were taken; the second day nearly four drachms; the third day three drachms; so that about ten drachms were taken in the three days. The quantity was nearly the same as in the experiments with tartrate of potash; but the ammonia salt did not affect the urine in the same way as the potash salt did. However large the dose, I could not make the urine alkaline; the variations in the acidity of the urine proceeding as if no medicine had been taken, with this exception, that the acidity appeared to be increased by the tartrate of ammonia. From this result, it appeared to me highly probable that even tartrate of ammonia was oxidised. I have already shown you that this conjecture was confirmed, by my finding nitrous acid in the urine when tartrate of ammonia or other salts of ammonia were taken into the stomach.

Thus much for the variations of the acidity of the urine. This will enable me to bring before you the chief object of this lecture, which is to show why it is that the red deposits in the urine take place so copiously. The most frequent form is that which you see in the specimens in the two bottles before you, which are rendered thick by it. This deposit quickly dissolves on the application of heat. It consists of urate of ammonia, and very frequently, probably, of urate of soda. It occurs so frequently with almost every one, that it cannot be considered as a sign of disease, nor even of indigestion. While the urine is warm at the temperature of the body, the deposit is held in solution; and, as I said, it can be at any time re-dissolved by the application of heat. There are two other causes, in addition to the decrease of temperature, which effect this deposit; and, unless these are recognised, you cannot account for those strange variations which are apt to occur in all people. I have here three specimens of urine, passed at different periods of the day: first, just before breakfast; second, after breakfast; third, much longer after breakfast. The first is thick, the next is clear, and the third thick again. Your first supposition would probably be, that the thick specimens contained more of the matter which forms the deposit than the clear one; but you would be totally wrong in judging by the eye as to the quantity present. For example: the first specimen contains a deposit of urate of ammonia, and the second specimen is quite clear, free from deposit. Now, if you were right in your judgment, I ought to find, in determining the amount of urates by the balance, that the first specimen contains much of this substance, whilst the second contains but little; moreover, the third specimen, which is the thickest, should contain considerably more than the first. But by analysing the specimens, I obtain a totally different result; I find that the specimen which is clear contains most uric acid, and the thickest specimen does not contain so much uric acid as the cloudy specimen. The explanation is this: the first specimen is strongly acid, whilst the clear specimen is neutral, or very slightly acid, and the third specimen is much more acid than

the first. This shows that a state of increased acidity may lead to the deposit of urate of ammonia; and that a state of decreased acidity will mislead the eye that judges from appearances.

Let me illustrate the variations of the uric acid more fully, by referring to the table at the commencement of this lecture; you will see that the urine passed at two o'clock p.m., after the digestion of mixed food, contains on an average 0·52 gr. of uric acid; and its acidity is such, that it requires thirteen measures of test alkali to neutralize it. At seven o'clock p.m., before dinner, the amount of uric acid is 0·12 gr.; and the acidity requires, to neutralize it, 26·12 measures,—the specific gravity of the urine, however, remaining nearly the same. After vegetable food, at two o'clock p.m., the quantity of uric acid is 0·56, and the acidity is represented by 8·89 measures. Long after food the quantity of uric acid is only 0·05, the acidity requiring 26·36 measures of test alkali to neutralize it. At night, after food, the uric acid is increased, but the acidity much diminished. The same table (No. 1) shows also the variations effected with animal food. The following table shows the highest and lowest amount of uric acid that I have met with in health, after animal and after vegetable food.

Highest and Lowest Amounts of Uric Acid.

Highest after animal food	... 1·02 grs. per 1000 urine	...	1027·8
,, vegetable food	... 1·01 ,,	..	1025.6
Lowest after animal food	... 0·05 ,,	...	1024·8
,, vegetable food	... 0·05 ,,	...	1024·0

From this table, you see that it makes no material difference in the quantity of uric acid in the urine, whether animal or vegetable food is taken. Here is a most conclusive diagram, which shows the amount of uric acid, together with the degree of acidity, and the appearance of the urine passed at the same time on three different days.

Variations of the Appearance, the Acidity, and the Amount of Uric Acid.

P.M.		Grs.	Sp. Gr.	Acidity.	Uric Acid.	Appearance.
7	Urine	1000	1029	+ 15·5 measures	0·29 grs.	thick.
10	,,	...	1027	— 0 ,,	0·33 grs.	clear.
8	,,	...	1030	+ 21·5 ,,	0·81 grs.	thick.
11	,,	...	1030	— 0 ,,	0·96 grs.	clear.
5	,,	...	1028	+ 14·9 ,,	0·52 grs.	thick.
11	,,	...	1031	+ 2.9 ,,	0·87 grs.	clear.

These experiments must clearly prove that the deposit does not depend upon animal food or upon vegetable food; that these do not produce a distinct effect upon the quantity of urate of ammonia or uric acid in the urine; but that the thickness in the urine depends upon the degree of the acidity. If the degree of acidity is slight, a large quantity of urate of ammonia may remain in solution; if the acidity is considerable, then even a small quantity of urates may give a precipitate.

The way to determine the amount of uric acid is the following:—About one or two thousand grains of urine are taken; hydrochloric acid is added in the proportion of about two drachms to one thousand grains of urine. The urate of ammonia is decomposed; and, on standing for at

least twenty-four hours, the greater part of the uric acid crystallizes out. The crystals are thrown on a fine filter, washed with distilled water, dried, and weighed, and thus the quantity of uric acid can be determined. Let me show you the first effect of the acid. I have here a glass jar, containing a liquid which we may suppose to represent urine, but it is really the excrement of the serpent dissolved in caustic potash. You see there is in the solution a slight deposit of urate of potash, but you get no idea as to the quantity of uric acid dissolved by merely inspecting it. As long as it remains alkaline there will be little if any separation of urate of potash from the liquid; but if I add to it hydrochloric acid, see then what will happen. Look at the curdy mass which will be precipitated, so solid that this heavy glass rod will easily stand in it. (Experiment.) Thus you can form no conjecture as to the quantity of uric acid in solution in any fluid by simply looking at it. All the uric acid present must be first precipitated. I added a considerable quantity of hydrochloric acid to the jar. If I had added but a small quantity, I should have precipitated only a portion of the uric acid which was in solution, but by adding an excess of hydrochloric acid, all the uric acid has fallen as a precipitate. It is interesting to notice the form in which this is first precipitated. You have seen that at first it is quite gelatinous, and the glass rod will easily stand in it; but in the course of a short time a change will be effected, and the mass will become much more liquid, so that the rod falls as you see it falling, and in a short time the contents of the jar become so fluid that they can be poured out. The first precipitate is undecomposed urate of potash; it has been called hydrated uric acid, but I do not believe that it is so. The first precipitate is urate of potash, because the uric acid is not set free immmediately; it requires that the hydrochloric acid should be some time in contact with the urate of potash to decompose it. So also, if you slowly add hydrochloric acid to urine, you will frequently find a thick deposit formed rapidly; this deposit will redissolve by heat; it will not become changed into an insoluble substance; it will require, for this purpose, to stand for twelve, twenty-four, or perhaps forty-eight hours, and then the precipitate will be far less bulky than before. If the quantity of uric acid be small, and the quantity of acid added be small also, it will require a long time before the whole urate of ammonia will be decomposed, and the uric acid will be deposited in a crystalline form. I have no doubt that this is a most happy preservative from the more frequent formation of uric acid calculi. We have free acid passing off with urate of ammonia in the urine, and they may remain in contact therein for a time, provided the quantity of free acid be not great, without the uric acid being set free, so as to form red gravel. Most commonly urine containing free acid must stand some hours after it has passed from the bladder before red crystals become apparent; nevertheless, sometimes the urine contains so much free acid that the uric acid crystals are found in the bladder, and even the kidney. I have dwelt on the fact of urate of ammonia not being immediately decomposed by free acid, because I do not doubt that thereby we are daily saved from the formation of that gravel which constitutes that kind of calculus which is found most frequently to occur.

I have thus tried to bring before you the causes which lead to the deposit of urate of ammonia, and to the formation of uric acid calculi. I might say, that the acidity produced by the stomach is the cause; and that, in comparison, all other causes may be neglected. The quantity of acid set free in the stomach is not easily calculated; it certainly produces a greater effect on the urine than three drachms of dilute sulphuric acid does,—most probably the gastric juice produces a greater effect on the urine than six drachms, or perhaps more than one ounce of dilute oil of vitriol. As to the quantity of acid in the gastric juice no right conjecture can be formed as to its amount. We cannot collect the whole of the gastric juice, and even if we could it would be impossible to say how much of the acidity comes from changes in the starch and sugar of the food. However, the variations of the acidity of the urine, when animal food only is taken, shows how much the acidity of the stomach affects the acidity of the urine. The liberation of acid in the stomach is one great cause of the acid re-action of the urine, and occasional increased acidity of the stomach first gives rise to occasional deposits of urate of ammonia in the urine. When the acidity of the stomach becomes more frequent, these deposits become more frequent in the urine; and when the acidity of the stomach becomes increased in intensity as well as in frequency, then the deposit of urate of ammonia gives place to a formation of uric acid crystals, which ultimately form these immense masses of calculous matter which you see on the table before you.—*Med. Times, Oct.* 25, 1851, *p.* 425.

60.—ON THE ACID REACTION OF THE URINE.

By Professor C. G. Lehmann.

The following paragraph contains a summary of all that is known regarding the acid reaction of the urine:—

The cause of the *acid reaction* of normal urine long remained obscure. This acid reaction was formerly attributed to the presence of lactic acid, and even of acetic acid; Liebig has, however, investigated the subject, and shown that it can only be dependent on acid phosphate of soda. If we dissolve ordinary phosphate of soda in water (thus forming a solution with an alkaline reaction), and gradually add uric acid (which has no reaction on vegetable colours), and apply heat, we obtain a fluid which reddens litmus, and which, on cooling, deposits a white, crystalline powder, presenting under the microscope the most beautiful groups of prismatic crystals of urate of soda. Now, if so weak an acid as uric acid can abstract a portion of its base from phosphate of soda, there can be no doubt that stronger acids, as hippuric, lactic, and sulphuric acids, directly on their formation in the metamorphosis of animal tissue, convert the neutral phosphate of soda into an acid salt, in which form it passes with the sulphate, lactate, and hippurate of soda into the urine. If the acidity of normal urine generally can be explained in this manner, the fluid should never saturate more base than corresponds to its quantity of phosphate of soda. The experiments which have been made to

elucidate this point, are, however, not so easy to conduct as might at first sight appear, for after treating urine with an alkali till there is neither an acid nor an alkaline reaction, it will still contain acid phosphate of soda in solution; for the neutral phosphate of soda has an alkaline reaction, and, therefore, the acid salt (if the urine exhibits no reaction on vegetable colours) is still not neutralized. I have endeavoured to ascertain the quantity of free acid in the urine in the following manner:—The urine was precipitated with an excess of chloride of barium, the precipitate boiled with water containing sulphuric acid, and the weight of the sulphate of baryta determined; an equal quantity of urine was then digested with freshly precipitated carbonate of baryta, till all acid reaction had disappeared; the filtered fluid was then acidulated with a little acetic acid, and precipitated by cloride of barium; this precipitate also was washed with water containing sulphuric acid, and weighed; the quantity of the latter was far less than that of the first-weighed sulphate of baryta, the difference of the weights corresponding to a quantity of sulphate of baryta whose base had been exactly sufficient to saturate the free acid contained in the urine; hence we can readily calculate from the chemical equivalents the quantity of the free acid or of the acid phosphate of soda. Now, if the calculation thus made did not give more acid phosphate of soda than was shown by a differently-made analysis to be actually contained in the urine, the acid reaction of the urine would be *alone* dependent on the acid phosphate of soda. This was certainly often the case; but both in healthy and in morbid urine I frequently met with the opposite condition, that is to say, in comparing the baryta-salts, the quantity of acid phosphate of soda which was calculated was more than that found by direct analysis; hence, in the majority of cases, in addition to the acid phosphate of soda, the urine must contain a free organic acid, or another acid salt capable of reddening litmus. We must not, however, arrive at our conclusions too rapidly, for the acidity of the urine after its discharge often increases so rapidly from the formation of lactic or acetic acid, that the excess of the free acids found in the above experiments might depend on lactic acid developed in the urine after its excretion. In morbid urine, however, we often find so great an excess of free acid over the phosphate of soda, that to these cases the above objection cannot be applicable. The acid reaction of the urine depends, therefore, in many cases, not only on the presence of acid phosphate of soda, but also on the presence of hippuric and lactic acids. If there were only acid phosphate of soda present, the phosphates of lime and magnesia in the urine could only be held in solution either as acid phosphates or by another free acid. If in the above calculation of the free acid from the precipitated baryta-salts, the earthy phosphates are included in the weighing, the result always remains the same, that is to say, there is more free acid than could be derived from all the acid phosphates of the urine. The water-extract of the urine usually has an acid reaction after repeated washings with alcohol, and solely on account of its containing acid earthy phosphates; these must, however, also be present when lactic or hippuric acid is the acidifying principle of the urine.—*Brit. and For. Medico-Chirurg. Review, October*, 1851, *p.* 330.

61.—ON HÆMATURIA.

By Dr. G. Owen Rees, F.R.S., &c.

[Blood may exist in the urine in different degrees; either in such quantities as that the red globules colour the urine by their quantity, or they may be so minute in quantity as to require the microscope for their detection, or the paler parts of the blood may be present, requiring chemical means for their detection. If it be effused in any quantity, the conditions of the various parts of the urinary apparatus must be considered. The treatment of the diseased conditions of these parts is so much within the province of the surgeon that Dr. Rees counsels physicians to remember this whenever hæmaturia cannot be satisfactorily explained on other grounds. There are one or two points to be noticed connected with the examination of urine containing blood. And first, with respect to the recognition of the blood corpuscles under the microscope.]

These bodies, as they float in urine, are seldom seen precisely as they appear in serum. They are thicker at their edges, and the colouring matter within them is paler. This condition is caused by the entrance of urine into the corpuscle—an effect which occurs in virtue of the law of endosmosis. The blood-corpuscle naturally contains within its membrane a fluid of the same specific gravity as the liquor sanguinis; and when, therefore, it comes in contact with the urine, which is far below the specific gravity of the liquor sanguinis, endosmodic currents are immediately set up, an interchange takes place between the contents of the corpuscle and the urine without, and, as the urine is of less specific gravity than the contents of the corpuscle, the interchange takes place in such manner that it enters the corpuscle in greater proportion than the contents pass out; and thus the body becomes distended.

I shall hereafter have occasion to allude to the presence of pus and mucus in the urine, together with blood, and to the importance of detecting them, inasmuch as we are thereby greatly assisted in our diagnosis in certain obscure cases of hemorrhage; and I will therefore now describe the appearances presented by pus and mucus when so observed. Pus and mucus corpuscles are both larger than those of the blood: they are colourless, and variegated on their surface: whereas the blood corpuscle is smooth and of a light yellow colour. The pus corpuscle very closely resembles the mucus; but, if carefully examined, we observe that it is dotted and granular rather than variegated on the surface, and of looser texture than the mucus corpuscle. The reactions of urine containing blood are easily appreciated; and there is but one source of fallacy to which it is necessary to direct your attention. This consists in a condition of urine which will seldom be present to confuse you, and I have not seen it more than twice. I allude to the brilliant red colour sometimes produced in urine by certain articles of diet. Many vegetable matters colour the urine of a fine amber colour; the pyrola and sumach possess this property in a marked degree. Sometimes this colour will nearly approach to red; and occasionally, when beet-root has been eaten, the colour observed in the urine is so completely that of blood, that it is impossible to discriminate without having recourse to the use of reagents. The distinction is easily made, how-

ever. If the urine be tested by the liquor potassæ, a dirty brownish precipitate is produced if the colour be owing to blood; but, in the case of vegetable colouring matter, the urine will become of a fine green tint.

When blood is present as a deposit in urine, in any quantity, we may be sure that albumen exists in solution; and it is important that we should know, within certain limits, the corresponding degree to which we may expect the urine to be albuminous for any given quantity of red corpuscles which may appear in it. An approach to tolerable exactness may be attained by practice and attention to this point; and it is one of great value in the diagnosis of urinary diseases. When we boil urine containing albumen, if it be acid, as is generally the case, a precipitate is produced. Now when blood is present, you will be surprised how much of it is required to produce an amount of albuminous precipitate such as characterises cases of ordinary albuminuria. Unless, indeed, the urine present the appearance of being made up in very large proportion of blood, the amount of albumen will generally be trivial. This will not appear extraordinary to those who are in the habit of observing how much show a little blood can make; and the quantity of albumen in the urine of morbus Brightii may well appear comparatively great, when it often amounts to as much as indicates the disintegration of several ounces of blood per diem; and one ounce of blood will make a great show in the quantity of urine passed in twenty-four hours. The importance of paying attention, then, to this point, principally consists in our being able occasionally to detect the morbus Brightii by showing an amount of albumen in the urine far above that indicated by the red corpuscles present.

Returning to the pathology of the subject, let us now assume that careful examination of the bladder and prostate gland has satisfactorily shown that the kidneys or ureters are the source whence the blood contained in the urine must be derived, and consider to what conditions of those parts the hemorrhage should be attributed. First as regards idiopathic hæmaturia. This bleeding from the surfaces of the kidney, without any especial cause beyond exposure to cold or to the vicissitudes of climate in warm and damp localities, has been considered as rare by most writers. For my own part, it has so frequently occurred to me to detect the cause of such hemorrhage in lesion of some organ, that I am much inclined to deny hæmaturia ever occurs, except as an indication of decided disease of the kidney or other part of the urinary apparatus. It is true, idiopathic hæmaturia sometimes occurs, together with hemorrhage from other mucous surfaces, in those who ascend to great heights, and who consequently suffer the loss of that amount of atmospheric pressure which preserves the conditions of equilibrium necessary to the safe circulation of the blood; but we may at once exclude such cases as these from the consideration.

With respect to the appearance of the urine, Dr. Prout considered that. when blood tinctured the whole fluid, appearing equally dissolved throughout it, that the kidneys were generally involved. This is an observation which experience certainly verifies. When such an appearance is observed, however, it co-exists or alternates generally with blood as a deposit, and we may conclude that there is calculus in the kidney,

or that the organ is the subject of other diseased condition, attended either with great congestion, granular deposit, or malignant disease. The detection of the real state of matters becomes very important in such cases. The symptom is a prominent one, and the patient's friends are sure to press the practitioner urgently for his prognosis. Now, though in most cases, if calculus be present, the history or severity of symptoms will assist us at once to the truth, yet it sometimes happens that such evidence is not afforded; and this is more especially the case when oxalate of lime calculi are contained in the kidneys. Under these conditions the urine may be bloody, and no other symptoms observed beyond dull lumbar pains. If oxalate of lime crystals exist in the urine, there is also pain in the penis, which does not affect the glans penis, as in stone in the bladder; but, on the contrary, is most plainly felt at the root of the organ.

Now, though in these cases the hemorrhage will generally follow upon some unwonted exertion, still it is not always so, and the case is thus greatly obscured; for we lose a most important adjuvant to our diagnosis. If the hemorrhage is the result of any of those chronic states of disease to which the name "morbus Brightii" has been given, we may easily detect that it is so, for then the hemorrhage which may occur will soon be found to give place to other conditions, in which the colourless matters of the blood alone become effused. We have here only to wait; and, whenever the urine may be excreted of its natural colour, to test it for the presence of albumen; and if this principle then be present in any quantity, without the colouring matter of the blood, we may be nearly certain that the further progress of the case will be marked by the continued excretion of natural-coloured urine containing albumen, and not by hemorrhage, and that the patient is suffering from some form of the morbus Brightii.

If, however, the urine, on becoming of its natural colour after an attack of hæmaturia, does not prove to contain albumen, then we may feel nearly sure that the hemorrhage proceeded either from a calculus in the kidney, or some malignant disease of the organ.

The diagnosis between these two conditions must depend on the observation of the following points.—

1st. In malignant disease the blood is generally passed in larger quantity than in calculus of the kidney.

2ndly. There is more frequent tendency to nausea *on slight occasion* than in calculus disease.

3dly. Microscopic examination of the urine will frequently show pus or mucus in excess, if there be calculus; whereas, in malignant disease, this sign does not so frequently exist.

4thly. The appearance of those suffering from malignant disease of the kidney, is nearly always indicative of a state of anæmia more or less advanced.

5thly. In calculus, hæmaturia generally follows upon some unwonted exertion.

6thly. Careful examination of the abdomen will frequently lead to the detection of tumour if there be malignant disease of the kidney.

To sum up, I should say, in the first place exclude from the consider-

ation, cases of what has been called idiopathic hæmaturia, which can scarcely exist under ordinary barometrical conditions; secondly, determine that the case does not belong to the morbus Brightii, by ascertaining that when the red particles cease to appear the albumen also leaves the urine; and, thirdly, when the hemorrhage observed is placed within these limits, determine whether it be owing to calculus in the kidney, or to malignant disease, by especial attention to the following points:—The appearance and complexion of the patient; the presence or absence of nausea on slight occasion; the presence or absence of pus and mucus in the urine mixed with blood corpuscles; and, lastly, by careful exploration of the abdomen for the detection of tumour.

Now as regards the treatment of the two forms of hæmaturia I have been speaking of,—viz., that produced by calculus in the kidney, and that which is the consequence of malignant disease.

From what I have already brought before you with respect to the treatment of alkaline urine, as produced by irritation of the urinary mucous surface, you will at once perceive that the condition brought about by the existence of a calculus can never be benefited by the exhibition of other than demulcent and alkaline remedies. It matters not how the calculus may be composed,—be it uric acid, oxalate of lime, or phosphatic, —be it soluble in acids or alkalies,—we cannot treat it chemically while in the kidney. Our object must be to render the urine as unirritating to the mucous membrane as possible, and enable that membrane thus to bear the presence of the calculus with as little inconvenience as possible. There is another indication, however, which we answer by this alkaline and demulcent plan, and a most important one. It consists in the relaxation of the spasm of the canal. By effecting this, a small calculus may be often brought away, which otherwise might remain to increase, and perhaps destroy the patient. It is with this view that we should combine our demulcent and alkaline remedies with such sedatives as the patient can bear without disturbance of stomach. Our most favourable result, of course, will be the expulsion of the calculus. Next to this we must hope that it will become encysted, and, by being so fixed in the kidney, cease to cause irritation; while we have to fear, as the worst result, the setting up of inflammatory action in the body of the kidney. This may terminate in the effusion of lymph in the tissue of the organ, and to a subsequent contraction of the inflamed part; and sometimes the patient may be so fortunate under these circumstances as to have the calculus which has caused the acute nephritis, should it be a small one, impacted in the kidney, so as to create no further irritation. In a great many of these cases, however, the acute nephritis terminates in suppurative disease; and if there be any constitutional imperfection dependent on strumous or syphilitic taint, this is the way in which we may generally expect the case to end. All we can do under these circumstances is to support our patient, exhibit opiates, and render the renal secretion as unirritating as possible. It is absolutely necessary that such persons should avoid exercise in any way beyond that necessary to walking gently, or exercise in any easy carriage. Neglect of this doubles the danger to the patient, while the difficulty of enforcing the injunction is often very great.

With respect to the treatment of cases in which the hæmaturia depends on malignant disease of the kidney, of course we cannot proceed with any hope of cure; but much may be done by attention to the general health, and by relieving those symptoms which arise as the result of the hemorrhage and the impaired state of the chylopoietic viscera. The anæmia so often noticed in these cases, which causes dyspnœa on slight exertion, and restless nights (from the facility with which any error in diet produces palpitation and throbbing of the carotids), may be to a great extent combated by the exhibition of iron in some palatable form. Perhaps the best preparation for the purpose is the tinctura ferri sesquichloridi, taken in doses of from ℿx. to ℿxx. three times a day, the bowels being watched the while, and kept regular by the exhibition of mild and aromatic laxative medicines.

It may be objected to the use of iron that it frequently tends to produce hemorrhage, and that we ought scarcely, therefore, to exhibit it; and it is quite true that care is necessary on this point. Watch the effects of the remedy, however, and you will constantly find you can exhibit it with advantage; that it will not induce hæmaturia, and especially if it be exhibited in the form of the sesquichloride of iron tincture. With regard to the use of styptics, they frequently appear useful in cases where the disease is not much advanced. One of the best I know, and which I have used several times of late, is the tannic acid, exhibited, if necessary, at intervals between the doses of iron in the form of pill. The dose should be from four to eight grains three times in the day. I may here remark, with respect to the use of this remedy, that, if you wish it should reach the stomach as tannic acid, you must not exhibit it in solution. You may, if you do so, have the good luck to give the first dose before it becomes changed; but tannic acid is rapidly converted into gallic acid when dissolved, and the best means of exhibiting it unchanged is in the form of pill.—*Med. Gazette, July* 11, 1851, *p.* 48.

62.—ON ALBUMEN IN THE URINE AS A SYMPTOM OF DISEASE.

By Dr. G. Owen Rees, F.R.S., &c.

[Upon this symptom, to which the attention of the medical profession has been directed for many years, and which forms the leading feature of the disease called morbus Brightii, Dr. Rees remarks:]

I shall not now describe the methods of detecting the presence of albumen, but, assuming the fact established, I shall beg your attention to the pathological considerations of which it is suggestive in the present state of our knowledge.

When Dr. Bright published his views on this subject, and declared his belief that an albuminous condition of the urine indicated a peculiar state of kidney, which commenced in congestion and terminated in the deposit of an adventitious matter in the tissue of the organ, some doubt was felt among pathologists as to the symptom indicating the condition described with any great degree of accuracy. It was thought improbable

that the state of kidney noticed by Dr. Bright could be the only cause capable of producing albuminous urine; and some were even so bold as to assert that many articles of food would produce a similar effect on the excretion. The exhibition of certain remedies also, and various pathological conditions, were quoted, which theory suggested as capable of bringing about the result; and, what with intrepid assertion on the one hand, and plausible reasoning on the other, considerable doubt was for some time cast on the diagnostic value of albumen in the urine. Among the articles of diet said to produce albuminuria I may mention pastry, milk, and cheese. Among medicines, some diuretics were thought capable of producing a similar effect; and mercury, if exhibited to salivation, was confidently spoken of as a cause for albuminous urine. The pathological states which have been at different times quoted as causes are very various and very numerous:—typhoid and typhus fever; certain forms of rheumatism; severe inflammatory affections, &c.

First, then, with respect to articles of diet:—Neither milk, cheese, nor pastry, will produce albuminous urine; nor have I yet been successful in obtaining from those who have made these loose statements a specimen of urine which gave the remotest indication of the presence of albumen, provided it had been previously shown free from that principle. I have also failed to detect albumen in the urine where diuretics have been given medicinally, though it is possible that in poisonous doses some of these may produce the effect. In poisoning by cantharides, albumen appears with blood in the urine: but such cases as these are scarcely likely to confuse your diagnosis. With respect to mercury, the impression was so strong on the minds of some that it always produced albuminous urine when exhibited in large quantity, that a few years ago I was at the pains of carefully examining the urine of persons who were undergoing salivation for syphilitic disease at Guy's Hospital, taking care to test the urine of each case before the exhibition of the remedy. In these experiments I entirely failed to detect albumen, and I have no doubt that the conclusion above alluded to was arrived at on theoretical grounds.

[The important conclusion Dr. Rees comes to, with regard to the presence of albumen in the urine is, that it must be regarded as most significant; that continued albuminuria, unconnected with lesion of the kidney, is rare; but we cannot, in such case, arrive at the conclusion at once that the patient is suffering from Bright's disease, because puerperal fever, asiatic cholera, pyelitis, and inflammation of the urinary mucous surfaces generally, will produce albumen in the urine; it will even appear in a variety of diseases before death, and also now and then during gestation. But, in cholera, puerperal fever, and gestation, there is little likelihood of any of these conditions being mistaken for morbus Brightii. In pyelitis, and inflammation of the urinary mucous surfaces, the cause is not so clear where a discharge of pus takes place. The fluid in which the pus globules float contains albumen, and this mixing with the urine renders it albuminous.]

Thus, in inflammation of the mucous membrane lining the pelvis of the kidney and the urinary tubes, or in inflammation of the lower por-

tions of the urinary mucous membrane, albuminous urine may exist. Though the general symptoms will by no means always assist us to discriminate between these states and the morbus Brightii, the microscope and chemistry will generally easily solve the difficulty. The nature of the deposit must be examined, and we shall find the pus corpuscles present in quantity if the albumen in the urine depend on the above-mentioned causes, and not on kidney disease. The microscope will then detect the pus corpuscles in the deposit. An excellent test for pus consists in the addition of liquor potassæ to the urine, when the deposit if it be pus, is at once converted into a mucous fluid. This, when poured out from a vessel, exhibits its glairy character. This test was proposed by my friend and colleague Dr. Babington, and is often very useful in the extemporaneous examination of urine. Urine which is albuminous from the existence of Bright's disease, is also nearly always of a light specific gravity; and this is an important point to remember.

In any case in which the albuminous urine contains a deposit of pus, however, we must rather look to the mucous tissues of the kidney, and the membrane lining the bladder and urinary canals.

It not unfrequently happens that the cystitis consequent on calculus in the bladder produces purulent and albuminous urine, and there is then some difficulty in ascertaining whether that form of degeneration characteristic of Bright's disease may not be affecting the kidney at the same time. This is a point of some importance as regards the prognosis of the case, for if the kidney be so diseased the patient scarcely ever recovers from the operation of lithotomy.

It is necessary to obtain the urine free from pus before we can speak with anything like certainty in these cases. If we can succeed in doing this by means of demulcents and astringents, in conjunction with alkaline remedies, then we may proceed to examine the urine with some hope of arriving at a conclusion. If, for instance, the albumen leaves the urine in proportion as it becomes free of the deposit of pus corpuscles, and if, on the disappearance of the pus, the albumen cease to be present, then the albuminous urine was unconnected with the morbus Brightii. If, on the contrary, however, the disappearance of the deposit of pus leaves the urine still impregnated with albumen, then the morbus Brightii is probably present, and we ought to give an unfavourable prognosis.

Attention to this point is of vast importance, and I have known more than one case in which much disappointment and chagrin might have been spared the surgeon, had care been taken to inquire into this matter.

When albumen, then, exists in the urine, *without pus or blood* to account for its appearance, we may conclude that the patient is the subject of one of those forms of degeneration known as the morbus Brightii, provided we have excluded puerperal fever, gestation, and cholera, as possible causes. It must be remembered that bloody urine will occasionally be passed in Bright's disease; but the prominent and continuing characteristic is the secretion of an urine containing the serous part of the blood *only*, and when red blood corpuscles are to be seen they appear but for a day or so, and then the urine returns to its purely albuminous state. In the slight notice I am here able to give of the morbus

Brightii, I must omit the general detail of symptoms. I cannot refrain, however, from mentioning to you one or two points with respect to diagnosis, which you will find of value. You may derive great assistance from the observation of the following symptoms, which, when present, should always lead to the examination of the urine for albumen:—

1st. A puffiness of the face observed in the morning.

2ndly. Frequent calls to pass water at night.

3dly. A tendency to swelling of the wrists, often attended with pain, but not of a rheumatic character.

4thly. Dyspepsia, attended with frequent nausea.

Do not expect always to find pain in the loins in Bright's disease. It is *sometimes* a symptom, but far from *always*, and I warn you of this, because the absence of that pain may distract your mind from the right line of thought, when examining the more insidious cases of the disease.

With respect to your prognosis, it is important you should remember that this disease is by no means necessarily fatal. Cases which are detected early are frequently cured, and those who suffer from the more advanced stages may be kept alive for years under judicious treatment.

One great point to keep in view, especially as regards the application of remedies, is, that the albumen passing away by the urine is impoverishing the blood, and not only thus decreasing the proportion of albumen, but likewise interfering with the formation and development of the red corpuscles, so that patients become rapidly anæmiated.

The relation between the contents of the red corpuscles and the chyle becomes changed in consequence of the drain of albumen lessening the specific gravity of the liquor sanguinis, in which the corpuscles float. Now the chyle supplies iron to the red corpuscles, and contains that metal dissolved in its serum for that purpose, and when in the healthy state the chyle enters the blood through the thoracic duct, it produces certain physical changes. The specific gravity of human chyle is about 1027; that of the fluid in which the corpuscles float is 1050 to 56; and the fluid contained in the corpuscles must of necessity be of the same specific gravity, in virtue of the endosmodic law. When the chyle mingles with the liquor sanguinis then it lessens its specific gravity, and *in health* there is an endosmodic action exerted, which draws a considerable proportion of the chyle within the blood corpuscle, the law being that the heavier will draw the lighter to its own side of any membrane, in larger proportion than the lighter can draw the heavier.

It will be obvious now, that if we lessen the specific gravity of the fluid in which the corpuscles float, *by abstracting its albumen*, we shall also lessen that of the contents of the corpuscle. The contents of that body will then approach to the specific gravity of the chyle, and that fluid will therefore enter the corpuscle the less freely, and there will be less iron supplied to it for its nourishment. Thus it is that anæmia, or a deficiency of red corpuscles, will always follow as a consequence of a drain of solid matter from the blood.

Now the point of treatment on which all this bears, is the propriety of doing all we can to render the blood as nearly as possible of its proper specific gravity. Owing to this drain of albumen there is an excess of water in the blood, and, as I have said before, the corpuscles subse-

quently become deficient. How are we to remedy this evil, and what remedies should we call to our aid? It is satisfactory to know that theory here suggests what experience has long ago discovered, viz., the use of hydragogue cathartics, vapour baths, and iron. I by no means recommend the indiscriminate use of iron. It is not admissible in the early stages of the disease when active symptoms are present. It must rather be looked upon as cinchona and quina are wont to be regarded in the treatment of rheumatism, and it must follow the antiphlogistic treatment recommended in class works on this subject. To its great value, however, in the anæmia caused by the morbus Brightii, all who use it will, I am persuaded, most readily testify. As regards the use of iron generally in anæmia, I must here beg your indulgence while I urge upon you to persevere in its use in spite of those occasional complaints on the part of the patient, which in most cases arise from the inconvenience experienced from changes of temperature, or moisture, or errors in diet. It is not uncommon to hear it stated that iron does not agree in all cases of anæmia. It so happens that one of my duties at Guy's Hospital consists in seeing the female out-patients, and I doubt very much that any practitioner on the face of the globe orders as much iron as a medicine as I do; and I speak advisedly when I say that I scarcely ever knew a case in which I had to withdraw its exhibition, and that I never knew a case of chlorotic anæmia in which it did not prove of eminent and marked service.

I have had complaints during the progress of the case of headaches and restlessness, but have always found a purge and perseverance in the iron effect a cure. If you desist from its use for every change of weather which may for a time further relax the system and ruffle the temper (especially that of the more susceptible sex), your difficulties will never cease, and your only consolation will be, that most imperfect one, the multiplication of your fees; for you will retard the progress of the patient's cure very materially. Persevere—abstract the excess of water from the blood by saline purges, and afford the stomach every opportunity of introducing iron into the system.—*Med. Gazette, July* 11 *and* 25, 1851, *pp.* 48 *and* 133.

63.—ON THE PRESENCE OF THE EXTRACTIVES OF THE BLOOD IN THE URINE WITHOUT ALBUMEN.

By Dr. G. Owen Rees, F.R.S., &c.

[Dr. Rees now brings before our notice another kind of effusion from the renal secreting surface, neither blood nor serum, but of *some of the components of the serum.* Dr. Rees urges the importance of this, though in consequence of the difficulty felt in recognising it, it has not yet been investigated by the profession. Dr. Rees proceeds:]

Keeping in view that the renal surface has been proved subject to an effusion of serum under special conditions, let us now look into the general question of effusion, and the constitution of the various fluids poured out in different parts of the body, and remember how the constituents of the blood are found to divide themselves to form fluid

deposits in disease. Taking the chemical history of serous effusions generally, we shall find that in pleuritis and peritonitis of an acute character a fluid is poured out characterised by the presence not of the entire blood, nor yet of the serum, but that the liquor sanguinis is poured out, and that this separates after its effusion into serum and fibrin; the former forming the effused fluid, and the latter depositing in those various forms known as plastic matter, false membrane, &c. Again, serous effusions, especially when of a passive character, are characterised by the absence of fibrin. In fact, serum and not the liquor sanguinis is effused, and this form of effusion varies greatly in its specific gravity. It may contain a larger or a less quantity of albumen. Now, if we look to the more delicately constructed serous membranes, we find conditions which but rarely pertain under inflammations of the pleuræ or the peritoneum. And it is with these more delicate membranes, such as the arachnoid, both in the brain and as it surrounds the spinal cord, that we may more justly make comparison with the secreting surface of the kidney. The effusions into these membranes, though they occasionally contain both fibrin and albumen,—that is to say, though they may deposit plastic matter, and be coagulable by heat, are more commonly constituted of those parts of the blood denominated extractive matters, and which exist in combination with the various alkaline salts of the blood. This is especially the case when the inflammation producing the effusion is of a chronic or subacute character; when the blood merely pours out its water, extractives, and salts. In some cases of arachnitis I have known the fluid effused to consist almost entirely of water, the evaporation of half a pint of it yielding scarcely any residuum. Thus, so far as the chemical history of effusions can assist us, we perceive that the blood may cast off—1st, water alone; 2dly, water, extractives, and salts; 3dly, water, extractives, salts, and albumen; 4thly, water, extractives, salts, albumen, and fibrin.*

In applying what I have now described to you as the results of analysis to the consideration of urinary pathology, you will at once perceive that as we have the serum of the blood effused by the kidney in certain diseased conditions, analogy suggests the probability that there may be some pathological states in which the extractives and salts only may be effused in the urine with the water of the blood, the albumen not appearing.

The subject having presented itself to my mind as I have now described it to you, I determined, a few months ago, on making some observations on the patients at Guy's Hospital, with a view, if possible, of determining whether such a drain of the extractive matters of the blood really ever took place,—whether, in fact, the blood were thus sometimes losing its solid constituents in a form we had not yet learned to recognise for want of proper chemical tests of its presence. We possessed ample means of detecting the serum of blood when present in the urine from the reaction afforded by the albumen; but the question now was—How could we detect the extractive matters and salts, which are

* I would here refer those who may be interested in the question of effusions generally, to a most valuable paper on the subject, written some years ago by my friend, Dr. Babington, and published in the Medico-Chirurgical Transactions.

not only colourless, but very nearly resemble in their chemical reactions the extractive matters naturally existing in the urine? Considering this question, it occurred to me that one of the extractive matters of the blood was precipitable by the tincture of galls; whereas the extractives of the urine possessed this quality in but a slight degree. It became, therefore, a matter of interest to determine in how far this test was capable of making pathological distinctions, and whether the presence of the extractives of the blood in the urine without albumen were significant of any particular disease or of any class of diseases. It struck me that if the analogy between the effusion of serum by inflamed serous membranes and by the secreting surface of the kidney held good, we ought always to find the extractives of the blood effused into the urine with the albumen in albuminuria, as this always happens when albumen is present in ordinary serous effusions. To determine this, my first experiments consisted in testing albuminous urine with the tincture of galls. I began by separating the albumen by brisk boiling and filtration; and having ascertained that the filtered fluid no longer contained any of that principle, I then tested it by the tincture of galls to see if the extractives of blood were present, and had coexisted with the albumen. The test gave, in all these cases of albuminuria, a most abundant precipitate, showing the analogy between the effusion which occurs in the morbus Brightii and that observed in serous membranes. My object being so far attained, I now proceeded to construct a table which should show the reaction of the urine in such cases as I could obtain among the patients in Guy's Hospital. I had a column devoted to the test by boiling, and another to the test of nitric acid, so that I might be able to exclude from the consideration all cases distinguished by the presence of albumen. A third column showed the reaction of the tincture of galls. As the labour of collecting and weighing the precipitates would have been great, and, moreover, unnecessary in these comparative experiments, I employed three terms to describe the amount of coagulation produced by the test. The first degree was designated "copious;" the second, "considerable;" and the third, "slight." I was assisted in this work by two of my most intelligent clinical clerks, Messrs. Crawcour and Bown; the cases being principally taken from the clinical wards. The general result shown by the table we used was—

1st. That whenever albumen was present in quantity in the urine, it was always accompanied by the extractives of the blood in large proportion.

2dly. That the cases in which the extractives of the blood were in the urine in large proportion were generally those marked by debility.

3dly. That cases of anasarca, with disease of the heart, and *unconnected with albuminuria*, also showed the extractives of the blood to be excreted by the urine in quantity.

4thly. That cases of chlorotic anæmia and hysteria gave copious precipitates.

5thly. That when in albuminuria the albumen became deficient in the urine, which we know often happens in advanced cases, the blood extractives also decreased in quantity.

6thly. That in cases of anæmia the proportion of blood extractives

observed in the urine diminished as cure was proceeding under the use of ferruginous tonics.

The limited number of cases which have as yet been observed, and the extended nature of the enquiry, make it right that we should be careful in drawing conclusions. I think, however, we may safely state that we have already proved beyond a doubt that in certain diseased conditions an important drain upon the blood is going on, of which we have been totally ignorant up to the present time.

That urines vary in their reaction with regard to any test, would be in itself enough to show the importance of analysing the fact; but when we remember that tincture of galls is the precipitant of one of the extractives of the serum of blood, and that albuminous urine containing the serum of the blood gives the most copious result when tested by galls, we must at once admit that the blood is becoming disintegrated when the urine is precipitable by the tincture, and feel the propriety of watching this source of waste in those forms of disease in which it may hereafter be proved to exist. From what I already know, I think we may confidently hope, at no very distant period, to connect this effusion of the blood-extractives into the urine with a peculiar state of kidney—a condition producible, probably, by more than one pathological action, but one which it is highly necessary to counteract in all. We may consider that a new symptom has been afforded us by chemistry: it remains for us, however, to ascertain its precise value, by determining the correct interpretation to be put upon the indication.

When I was speaking of the anæmia which occurred as a sequel to albuminuria, I explained how it was a necessary result of the impoverished state of the liquor sanguinis in which the corpuscles float. We see now, however, that a drain may go on from the liquor sanguinis by its *extractives passing away by the urine*, without any albumen appearing, and that we may thus have another cause for the appearance of anæmia besides that of a drain of albumen; for the extractive matters tend greatly, by their presence, to keep up the specific gravity of the blood. Reflecting upon this, it occurred to me that, in some of those cases of anæmia in which we entirely fail to detect any adequate cause for the symptom, we might perhaps find that the blood became impoverished by the extractives passing away in the urine; this deterioration of the liquor sanguinis being followed, as in the case of albuminuria, by the destruction of the corpuscles.

This is a point deserving of attention; but at present I can do no more than direct the attention of practitioners to the investigation of such cases with relation to the condition of the urine. My friend and colleague, Dr. Addison, has shown that the renal capsules become implicated in this form of disease—a fact of some interest in connection with what I have above stated. It may be well to mention that, in a case of diabetes insipidus, I lately found the blood extractives coming away in very large proportion.

I would not wish it to be supposed that I attach an undue importance to this symptom of urine being precipitable by tincture of galls. The urine of those whose condition approaches to perfect health will often show traces of the presence of the extractives of the blood; and I have

reason to believe, that whenever, from hard labour, mental or physical, a certain amount of anæmia follows, the urine will be found impregnated with these extractives. Perfectly healthy urine, however, shows but a slight precipitate on the addition of the tincture.

It is absolutely necessary to remember, in applying this test, that the reaction to be observed is that which immediately follows the addition of the galls; for, if we wait, we almost always get a considerable precipitate; the earthy and potash salts coming down, owing to the precipitating action of the spirit contained in the tincture, and probably other changes occurring.

What we already know, then, of this indication only goes so far as to show that it is the continuance and excess of the discharge of blood extractives that must make us anxious, and that, like the presence of oxalate of lime crystals in the urine, it may often exist without any material variation from the healthy state. Like oxaluria, however, it is an indication that requires watching; and I believe further research may show it to be still more important than we are entitled to declare it in the present state of our pathological knowledge.—*Med. Gazette, July* 25, 1851, *p.* 135.

64.—ON THE SEPARATION FROM THE BLOOD OF AN EXCESS OF WATER BY THE KIDNEYS.

By Dr. Owen Rees, F.R.S, &c.

Let us first consider the uses of water in the blood, the ends answered by its presence, the necessity for its frequent removal, and for the supply of fresh water to the system.

The first and most obvious use of water in the blood is to maintain its fluidity, and thus to enable various salts and other matters to be presented to the organs in such form as to enable their particles to receive the impress of chemical and probably electrical actions in a minuter state of division than can be compassed by other means. As regards the action of water in the blood, in its relation to the kidneys and the skin, we must especially regard the following points:—1st. The density of the blood is, in health, nearly always the same; and a large excretion of water calls for immediate supply of a like quantity to the blood; and this happens whether the excess of water have escaped by perspiration or in the urine. 2ndly. The changes which take place in the blood, more especially those of oxidation, and the formation of the alkaline phosphates and sulphates by the union of oxygen with the phosphorus and sulphur contained in the albuminous matters taken as ingesta, require water in order to wash away the salts formed as the result of this action.

Now there is a constant necessity for a supply of water to keep up the specific gravity of the blood, and to wash away the oxidated products as they are formed, whenever, from disordered action, the kidneys allow the water of the blood to pass away into the urine in large quantity. The sensation of thirst occurs in all such forms of disease, and its satisfaction is necessary in order to preserve the integrity of the blood.

It is true that the skin in excessive diuresis is dry, and that cutaneous transpiration is either lessened or altogether ceases; but the water which is retained in the blood by this action is by no means sufficient to compensate for the abstraction of water which goes on in nearly all cases of diabetes whether saccharine or insipid. The guide for the necessity of supply is the sensation of thirst, and it should always be gratified; for on whatever conditions the diabetes may depend (and, unfortunately, we are as yet greatly in the dark with respect to the pathology of this most interesting disease), it will be in vain to hope to treat it if we do not keep the blood up to its normal standard by supplying water to it at any moment it may be required. Let us think how the blood must suffer in those cases of diabetes, far from uncommonly met with, in which the urine amounts to eight and twelve pints in the twenty-four hours. Let us reflect on what the person who is the subject of disease must lose in water during the twenty-four hours. We may allow two and a half pints for urine, and two and a half pints for cutaneous transpiration, and we shall see then that the diabetic loses more than three pints per diem extra, assuming that his skin is absolutely inactive, which is rarely the case. Now six tumblers of water, or thereabout, taken during the twenty-four hours, is a very large quantity, but, I do not scruple to say, is seldom more than necessary to keep the blood in a proper state in diabetes, where eight pints of urine pass per diem.

There is a fear often expressed by practitioners that allowing the patient to drink irritates the kidneys, and so keeps up the flow of water—in fact, that the more the patient drinks the more urine passes. This is true if fluids be taken beyond certain limits, but it does not act materially when fluid is taken so as to satisfy thirst; and I have always seen greater improvement take place where this boon was granted to the patient; and everything we know of the blood, and the necessity of maintaining it at a certain fixed specific gravity, points to the propriety of allowing it.

Having alluded to diabetes in this manner, it might be supposed that I regard that disease as an effusion of water by the secreting surface of the kidney. Should such a condition obtain, however, it can only be a diseased state induced secondarily upon other evils more nearly connected with disturbance of the chylopoietic organs, and probably the brain. It is not my intention, however, to enter upon this subject, but merely to suggest that analogy would seem to point to the probability of an occasional increased flow of water from the kidney, as the result of some secondarily induced disease of its secreting surface.—*Med. Gazette, July 25, 1851, p.* 138.

65.—ON BRIGHT'S DISEASE OF THE KIDNEYS.

By Professor Christison. (From his Clinical Reports.)

[The usually considered pathognomonic symptom of Bright's disease is the coagulability of the urine. This Dr. Christison first considers. He says.]

In the first place, you must make sure that the coagulability is owing

to albumen, otherwise there may be no Bright's disease, nor any thing more than functional disturbance. Therefore you should always employ both heat and nitric acid as tests; and the best way is to heat the urine first, and then to try whether the coagulum resists nitric acid. Nitric acid alone may cause a precipitate of uric acid, when urate of ammonia is superabundant; heat alone may separate earthy salts when these abound; but a coagulum which resists both heat and nitric acid can be nothing else than albumen. In the second place, you must not take it for granted that Bright's disease is positively present, merely because the urine contains albumen. The urine is albuminous, when the patient labours under pyelitis or cystitis, that is, inflammation of the mucous membrane of the kidneys and bladder; because pus is freely thrown out in these diseases; and whenever pus is secreted by a surface, serum must be secreted along with it. The urine is also apt to be albuminous for some time after an attack of hæmaturia, whatever may be its cause; for the relaxation of vessels, which gives occasion to the escape of blood, is seldom so quickly put an end to, but that serum escapes for some time after blood has ceased to flow. A few days ago I saw a remarkable case of purpura hemorrhagica of the active kind in a gentleman of fifty, whose urine, two days after it had ceased to be bloody, was extremely albuminous. The action of a blister on the skin, if it irritates the kidneys or bladder, generally causes a temporary albuminuria, as I have again and again had occasion to ascertain. Mercurial action also is sometimes attended with functional albuminuria, which disappears permanently as the ordinary symptoms of mercurialism subside. In some individuals the use of certain articles of food, somewhat difficult of digestion, seems to cause a secretion of albumen from the kidneys for a very limited period. It is not uncommon to observe a very slight impregnation of albumen in the urine of confirmed dyspeptics, although no other sign of organic disease be discoverable, and the functional character of the affection is shown in the end by the albumen disappearing, at first from time to time, and at last for good and all. I have at present a lady under my care with dyspepsia, in whose urine there is sometimes oxalate of lime, sometimes a little sugar, sometimes a very little albumen, sometimes all three at once, sometimes none of these adventitious matters; nor does she present any other indication of organic derangement; and certainly there is no Bright's disease.

There can be no doubt, therefore, that albumen may appear in the urine from other causes besides Bright's disease of the kidneys, and that sometimes it is a very trifling matter. But at the same time I would advise you to look carefully after all cases in which this symptom appears in connection with mercurialism, dyspepsia, or dietetic irregularities. Two of the most decided cases of Bright's disease that I have encountered, commenced during mercurial action, excited in the course of the treatment of pneumonia: dyspepsia is one of the most frequent of the early symptoms of obscure chronic cases of the disease; and, when albumen is readily made to appear in the urine by peculiarities of diet, there may be reason to suspect that the irritation thus excited in the kidneys is near akin to that which leads to organic degeneration, and may subsequently pass into it. A medical friend, who had been long a

martyr to dyspepsia and neuralgia, but enjoyed otherwise tolerable health, once told me jeeringly, that we had over-rated the importance of albuminuria as a symptom of organic disease, because his own urine was never free of albumen. This statement, however, did not convince me of error; on the contrary, I thought that his dyspepsia, neuralgia, and dingy complexion might possibly be soon too well accounted for. Within two years he was seized with what was at first mistaken for bilious fever by his medical attendant, but which ended in gradual diminution of urine and fatal coma; and after death, the kidneys were found in a very advanced state of granular degeneration. So, too, a young graduate of this University, who was often made the subject of experiment by the late Dr. James C. Gregory of this hospital, in his inquiries into the quantity and density of healthy urine, and who could at any time impregnate his urine with albumen, by eating rather freely of cheese or pastry, fell about two years afterwards into decided Bright's disease, and died of it in no long time.

[The *Secondary Diseases* are very important, because they are chiefly those which destroy the patient, and are those requiring treatment generally. Some of these attend the acute, and some the more chronic forms of the disease. Dropsy is, perhaps, the chief, as its presence exasperates every other symptom, and its removal relieves the patient. Dyspepsia is another,—in this attendant we are advised to examine the urine in all cases of protracted and frequently-recurring indigestion. Obstinate chronic diarrhœa, sometimes fatal, either depending on ulceration of the intestine, or conjestion and relaxation of the mucous membrane. Insidious inflammations of the serous sacs, as pleurisy, pericarditis, &c.; these chiefly arise from exposure to cold. Bronchitis is always a source of additional misery to the patient. Affections of the head are not so common; but neuralgia of the extremities is a common and tormenting attendant of the chronic form. Concurrently with diseased kidneys do we generally find a diseased liver. In the same manner do we find hypertrophy and valvular disease of the heart. Dr. Christison does not think phthisis may be fairly regarded as a secondary affection. In speaking of the *causes* of Bright's disease, he says:]

The causes of Bright's disease are obscure. The chief *predisposing cause* is intemperance; and it is probable that this agent may gradually induce the chronic form without the aid of any occasional cause. The scrofulous diathesis is another predisposition. I stated this in my treatise on granular degeneration of the kidneys in 1839 as a probable proposition; but there can be no doubt now, that the disease is one of the maladies of the scrofulous diathesis. A strong predisposition is also engendered for a short time by scarlatina. The tendency is sometimes indicated even in the primary fever, by the urine becoming coagulable; in many cases it breaks out with unequivocal symptoms about the close of the third week; but if the patient escape for another week, he is generally safe. Until lately, many physicians doubted the connection, insisted on by myself and a few others, between Bright's disease and the secondary disorders which follow scarlatina; but no accurate or unbiassed observer can well entertain any doubt now. The puerperal state is another pre-

disposition, which has been established mainly by the observations made in this city by my colleague, Dr. Simpson, who meets with few cases of œdema in advanced pregnancy, or of convulsions at that period, or during delivery, without finding that the urine indicates serious renal disease. I have had several opportunities of observing the same facts, both in consultation with my colleague, and likewise with other obstetrical practitioners. There can be no doubt of the connection, and the discovery is of great practical importance, because in pregnancy, as in scarlatina, the occasional examination of the urine may enable the practitioner to foresee and provide for approaching formidable dangers. It has been supposed that other febrile poisons besides scarlatina may have the same effect of engendering Bright's disease, or a liability to it; also that it may originate in the sudden recession of extensive chronic cutaneous diseases. But on these two points, the facts hitherto collected are too few to be trusted. Age, sex, and station, are no farther predisposing causes, than in so far as persons of a certain age, station, or sex, may be more exposed than usual to other predisposing, and also to occasional, causes of the disease. I have seen it at the most advanced period of life, as well as at four years, and others have seen it in the new born; I have seen it often in the most comfortable, as in the most miserable, stations of society; and women are quite as prone to it as men. But without doubt it is proportionally more frequent in persons of middle life among the working classes of the community, than in any other circumstances. Of the *occasional causes*, which have been indicated by various authors, the most unquestionable and most frequent is exposure to unusual cold. It is remarkable how often the acute form of the disease is distinctly referred to some decided exposure to cold; and I do not know a more frequent variety of such exposure than sitting down, while overheated, on the grass or a stone. I think I have observed some cases to arise during mercurial action, without any other apparent occasional cause; and Professor Gluge found it by experiment to be produced by mercurialising dogs. Martin Solon says he has traced it sometimes to blows on the loins; a very probable cause, but one which has never come under my own notice. Gluge has further ascertained, that one pathological form of the disease may be produced in dogs by confining them to a too fatty diet: which has therefore been inferred to be a possible cause in man also. Dr. George Johnson found it to arise in animals kept closely confined in dark apartments, with little opportunity of exercise; which has been supposed to be an analogous connection with what is observed between this disease and the dingy confined habitations of the lowest orders of society. Finally, it is very probable that several of the causes which I have regarded above as merely predisposing agents, more especially intemperance, may develope the more insidious cases of the chronic form, without any other occasional cause; and that both scarlatina and the puerperal state may prove not only the predisposing, but likewise the occasional cause, in exciting the acute form.

[The *prognosis* may be said to be unfavourable. Some look upon it as desperate; others as fatal in the end, though often exceedingly deceptive in its symptoms. Though Dr. Christison thinks many cases admit of a radical cure, and others may be brought to a stand-still for a long period.

It is more favourable after scarlatina in pregnancy, or near delivery. Recovery is rare in the intemperate and strumous, and in those cases arising from fatty degeneration of the kidney.]

The unfavourable primary symptoms are, a scanty, pale, light urine, a very leucophlegmatic or dingy countenance, a chronic progressive emaciation, and above all a constant drowsy listlessness. A great proneness to secondary affections—especially to severe neuralgia, diarrhœa, chronic vomiting, and frequent dropsy—is also unfavourable; the conjunction of diseased liver or heart is always of evil omen. Dropsy for the first time, is not always an unpropitious sign; neither is bronchitis; and acute serous inflammations are no farther unfavourable, than by reason of their own proper risks, and the comparative difficulty of curing them when the kidneys are at the time diseased. It is particularly observable that all intercurrent diseases are more unmanageable and more apt to prove fatal in consequence of the renal disorder. The most mortal of all signs, are a very scanty urine of very low density, and extremely impoverished condition of the blood-corpuscles, and stupor verging gradually towards coma.

Morbid Anatomy and Pathology.—The most important morbid appearances in the kidneys are, in the early stage of acute cases, the signs of bloody congestion, both outwardly and in their intimate structure: in advanced cases of the same nature, enlargement; for the most part a lobulated, botryoidal, or granular, yet sometimes too a uniform surface, with injected reticulations of vessels in the hollows; and internally an invasion of the cortical and medullary structures, and diminution of their usually distinct striated appearance, in consequence of the effusion of a heterologous matter, generally of various tints of yellowish white, into which the material of an injection passes very imperfectly or not at all. In chronic cases, we may have the same appearances as in advanced acute cases. But often we find the kidneys not enlarged, sometimes even less than usual, occasionally atrophied to an extreme degree. Some have thought the atrophied state may be secondary to a state of enlargement from morbid deposition, this being subsequently absorbed; others conceive that atrophy may commence with the beginning of the disease; nor is it an easy matter to settle that question. In very slow cases, the adaptation of the constitution to the gradually degenerating structure of the kidneys may be such, that the patient is not cut off until there remains only a single tubular tuft in the medullary part of one kidney, and two, or perhaps a third, in the other. I have seen one kidney completely atrophied, and without any natural structure visible, and in the other an extensive heterologous deposit, leaving only two medullary tufts visible in a longitudinal section.

These morbid appearances are liable to many variations, which it is very difficult to describe, because it is not easy to define them. I must refer you for details to the original description of Dr. Bright, as well as that in my own treatise, and above all to the accurate delineations of Dr. Bright, or M. Rayer in his work on diseases of the kidneys.

Dr. Bright and his immediate successors were content with ascertaining the anatomical characters of the disease, so far as they could be ascertained with the unaided organs of sense. The result was a suspicion

which was strongly expressed by myself as well as others, that "future pathological research will probably show that there is more than one organic derangement" of structure concerned in producing Bright's disease. The fact is so. But it could scarcely have been proved without the aid of the microscope; which in this, as in other departments of pathology, has lately supplied most valuable information. It would take up too much of our time, were I to give you a detailed statement of the separate results which have been arrived at by the various microscopic observers who have successfully studied the subject. The principal observers have been Gluge, Goodsir, Johnson, Simon, Toynbee, and Gairdner. The most original observations are those of Gluge. The others coincide with him in all very essential points; but there are material differences in the views taken by each of some of the details; nor is this wonderful, considering the fallacies to which the microscopist's eye is subject, when he attempts to pierce deep into the minutiæ of organised structures. There is, however, a satisfactory coincidence of observation on the whole. And upon collating all the microscopic inquiries yet published with one another, and trying them by such opportunities as have occurred to me, I think we may arrive at a consistent doctrine, and one which is tempting alike in a theoretical point of view and in its practical bearings. I shall now state this doctrine in a series of propositions. You are not to suppose I insist on these as matters of assured medical faith; but I already regard them as probable; and it is therefore well to have them distinctly enunciated as the basis of future investigation.

1. The congeries of alterations of the kidneys, described by Dr. Bright and his more immediate followers in this line of inquiry, depend on at least two distinct morbid processes.

2. One of these is of the nature of inflammation, chronic or acute. The other is a morbid degeneration, always chronic, not inflammatory, analogous to what occurs in various other important organs, and consisting of the morbid accumulation of oil or fat globules.

3. The inflammatory disease in its acute form, although known to originate under various circumstances, and even independently of any pre-existing disease, is best and most frequently exemplified in the phenomena which occur in many instances subsequently to scarlatina, or in the puerperal state.

4. The chronic form of the inflammatory disease always originates obscurely, insidiously, and so gradually that, except in favourable circumstances, it escapes notice for a long time. But it ought always to be looked for by a prudent practitioner in cases of protracted or frequently-recurring dyspepsia, diarrhœa, neuralgia, chronic rheumatism, catarrh, anasarca, and those chronic cutaneous diseases which exhaust the constitution. And it is apt to present itself intercurrently with most other chronic diseases of the greater viscera, especially phthisis, diseased liver, and hypertrophy of the heart.

5. The inflammatory process, according to most observers, consists in a preternatural formation of epithelial cells in the lining mucous membrane of the minute uriniferous tubes of the kidneys, and the detachment or desquamation of these cells; so that, by accumulating in the interior, they obstruct the tubes and choke them up. There are also found in

the obstructing matter, blood discs, pus globules, uric acid crystals, and sometimes crystals of oxalate of lime. But the greater part of the mass consists of epithelial cells, entire, or much more commonly degenerated, so as to be irregular in their edge, contracted in size, or sometimes reduced actually to their nuclei. According to Gluge, the morbid formation rather consists of the more ordinary secretions of inflammatory action, such as fibrine, pus-globules, and exudation corpuscles; which not only accumulate in the uriniferous tubes, but are likewise thrown out in greater abundance throughout the surrounding interstitial texture.

6. The consequence is great obstruction to the secretion of the ordinary solids of the urine, and therefore a diminution of these solids, while the watery part may be long secreted as usual, or even in much more than the usual quantity. And the explanation of this interesting double phenomenon, which all must have often witnessed who are conversant with Bright's disease in practice, is that while the epithelial surface of the uriniferous tubes, considered by most physiologists to be the proper secreting tissue of the kidneys,—is grievously injured and diminished, the malpighian bodies,—supposed by some good authorities to secrete rather the watery part of the urine, remain for a long time little or not at all affected. This doctrine is a beautiful part of the pathological theory of the disease; but it rests on an insecure foundation, as several microscopic observers maintain they have seen the malpighian bodies oppressed by congestion within and pressure outside from the distended uriniferous tubes, at an early period of the morbid process.

7. As a result of the secretion of the water of the urine, the obstructed urine-tubes are often swept free of the obstructing material. But it does not alway follow that the tubes thus regain their secreting function; for they may have been permanently deprived of their epithelial cells, no longer renewed, or only in diminished number and in a degenerated form.

8. But an important consequence of this sweeping-out of the urine-tubes is, that we find in the sediment of the urine their morbid contents; and these are blood-discs [Fig. 2, *a*], degenerated epithelial cells, much resembling pus-globules, and still more, mucous corpuscles [*b*], also nuclei of epithelial cells [*c*]; and above all, as characterising this particular form or variety of Bright's disease, entire or broken down casts of the urine tubes [Fig. 1, 2, 3, *d*], consisting of blood-discs, nuclei, and especially epithelial cells, all united together in cylinders, and portions of cylinders, by a transparent agglutinating medium, which can scarce be anything else than fibrine. This is one of the most important practical observations yet made in the course of the whole microscopic enquiry. For if exact, it enables us to discover most readily with the microscope, the nature of any particular case, and to refer it to inflammatory action as its fundamental source.

9. The other morbid affection of the kidneys, constituting also what is comprehensively called Bright's disease, is a peculiar degeneration, unconnected with any form of inflammatory action, and consisting in deposition of oil-globules in preternatural quantity in the epithelial cells of the urine-tubes, distending these cells, detaching them from the epithelium-wall, distending consequently the tubes by their accumulation, bursting the tubes here and there, and so escaping into the interstitial tissue.

10. The pathological consequences to the structure of the kidneys are here much the same as in the inflammatory form of the disease. The urine-tubes, gorged with oleiferous epithelial cells, become useless themselves in the process of secretion, and by pressure around impede the function both of the unaffected urine tubes and of the blood-vessels. The secretion of urine is therefore much disturbed, in respect of its proper solids, and often too its watery part; but sometimes the watery portion is unaltered, or even superabundant. And whether abundant or scanty, it sweeps out from time to time the morbid contents of the tubes—without thereby restoring, however, the healthy organisation of their basement membrane, or the healthy discharge of their function.

11. An important consequence, in a practical point of view, is that in the instance of oily degeneration, as in that of inflammatory deposition, the urine contains characteristic microscopic ingredients in its sediment. Detached oil-globules may be found, though they are difficult to detect, because they do not subside. But degenerated epithelial cells, loaded with oil-globules, and distended often to a considerable size, are more easily found [Figs. 4, 5, *e*]. And there are broken, as well as entire, cylindrical tube-casts consisting of oil-globules, and epithelial cells gorged with oil-globules, and all connected by a transparent and probably fibrinous matrix [*f*]. In this affection of the kidneys, the tube-casts present few degenerated epithelial cells, in which there are not many oil-globules. In the inflammatory affection again, oil-globules are either wanting altogether in the degenerate epithelial cells, or at all events they are very scanty and minute. Oil-globules are always easily distinguished from nuclei, blood discs, and epithelial cells, by their rounded uniform shape, and their broad black margin, produced optically by their strong refracting power.

12. Such are the pathognomonic characters by which the two very different organic alterations of the kidneys may be distinguished during life. But the two affections may concur. After the inflammatory form has subsisted for some time, and many urine-tubes have become gorged, or empty and functionless, oil-globules may be secreted into the empty ones, together with a fibrinous matrix; so that oleiferous tube casts may be afterwards seen in the sediment of the urine, as well as those which are simply innammatory. Dr. Johnson first noticed this combination; Dr. Gairdner has observed it often; I saw it several times during last spring clinical course; and some have suspected it to be so frequent as to render a diagnosis between the two forms of organic disease for the most part impracticable. I am satisfied, however, that the two affections do occur independently of one another; and in particular I have repeatedly seen sediments presenting invariably the inflammatory character, or at least with only a few oil-globules in the degenerated epithelial cells. The occurrence of a few small oil-globules is no true source of confusion; because, according to the best observers, the healthy epithelial cell is not without a few of them.

13. To the affection which consists of fatty or oily degeneration, Gluge has given the unexceptionable name of *stearosis*, which expresses a fact but no theory. The nomenclature of the other affection is not so easy, and has not been so lucky. It has been called *desquamative*

inflammation, because it consists essentially of inflammatory action, causing the epithelial cells to scale off the mucous membrane of the uriniferous tubes. But there is equally scaling of these cells in the oleaginous degeneration. So that if this process is to enter at all into the nomenclature, the one disease should be called *stearotic*, and the other *inflammatory*, desquamation. I do not think, however, that these terms will be long thought quite accurate, or if accurate, altogether convenient. But I shall use them in the sequel, without pledging myself to their exactitude.

The observations which have come under my notice since becoming acquainted with these microscopic inquiries, bear out on the whole the conclusions stated in the preceding propositions. During especially my period of service as Clinical Professor last spring, there were many excellent subjects of study in these wards, and the opportunity was not neglected. Of seven characteristics cases of Bright's disease, which we were able to observe for a considerable period, only one presented the characters of stearosis, four those of the pure inflammatory form, and two the mixed characters of both affections, in which, however, the inflammatory tube-casts and epithelial cells were greatly more prominent than the stearotic. My experience at that time, in conformity with what I have observed since, leads to the conclusion that the inflammatory is much more common in this city than the stearotic form of renal disorganisation,—Edinburgh differing in this respect from London and Brussels, where stearosis seems proportionally more frequent, but corresponding with Paris, in which that degeneration seems comparatively rare. Our case of stearosis was the only fatal one; and this variety is probably always fatal.

Case 1.—The first is an instance of inflammatory desquamation, commencing, like that of Flint, in the hospital during treatment for another disease, and subsequent to mercurialization. The subject was a labourer of 22, William M'Millan, who had been cured of jaundice and diarrhœa a twelvemonth before in this hospital and was again attacked, fourteen days before admission, with the same unusual combination of diseases. When admitted on January 11th, 1850, he had no jaundice, but frequent watery diarrhœa, some pain across the lower belly, occasional vomiting, a sallow complexion, and considerable debility. The lungs were healthy, so was the heart, and the pulse was little excited; the liver was not enlarged; and the urine was ascertained at the beginning to be "natural in colour, without deposit, and not coagulable." Dr. Bennett, who was then on duty, treated the case with leeches, calomel, and opium, till the mouth became slightly affected, then with catechu and potash, and also one blister over the liver, which was subsequently the seat of pain and some tenderness. When I took charge of the wards on February 1st, he was considerably better; and he continued to improve under the use of bismuth, opium, and hydrocyanic acid. On the 20th February, his feet appearing somewhat œdematous, the urine was examined, and found to have become turbid even when just passed, very strongly albuminous, 1025 in density, not particularly scanty, and abounding with degenerated epithelial-cells [Fig. 1, *b*], and urine tube-casts [*d*], which for the most part presented the inflammatory

Fig. 1.

characters, but occasionally a few globules of oil. Under the use of cupping over the loins, Dover's powders nightly, and the warm bath every other evening, he slowly improved, sweating every night, and nevertheless passing daily from 70 to 90 ounces of urine, between 1017 and 1019 in density. Repeated examination of the urine showed continuing coagulability, abundant fragments of inflammatory tube-casts, very seldom containing any oil-globules, but occasionally octaëdres of oxalate of lime. In the beginning of March, it was for the first time observed that the abdomen contained fluid; and from that time a moderate ascites continued to be the predominant dropsical affection. Gallic acid was now tried in the dose of three grains thrice a-day, but with no decisive benefit; nor did the acid ever appear in the urine. The man remained in the hospital till the middle of April, when he became tired of his slow progress, and left it for the country. The urine had been for some time 120 ounces daily, without the use of diuretics; it was 1018 in density, and moderately coagulable; and the sediment showed degenerated epithelial cells and broken-down tube-casts, always of the inflammatory kind. The œdema had been removed, except that the ankles swelled a little at night; but the ascites had not altogether disappeared. I have not heard of him since; but his state at dismissal was obviously very precarious.

It is clear, from the precursory jaundice and supervening ascites, that although the liver was not enlarged, the affection of the kidneys was combined with an older disease of that organ; and in all probability this circumstance accounts for the little impression made on the renal

disorder by treatment, and it certainly added greatly to the man's jeopardy.

Case 2.—Not so with the next patient, who, as I consider, was radically cured of an uncomplicated attack of the purely inflammatory form of Bright's disease, occurring in connection with the puerperal state. This was a young woman, Elizabeth Birnie, 21 years of age, who had been delivered in the Maternity hospital, without any accident, on the 25th January, 1850, and was transferred to this hospital on the 8th February. For four weeks before her confinement she suffered from frequent scanty micturition, without any other complaint; and five days after delivery the limbs began to swell. When she became my patient, the face was puffy and very leucophlegmatic; the legs were œdematous as high as the knees, and pitted on pressure; the abdomen was rather full, but without distinct evidence of fluid in it. There was general tenderness of the abdomen, but none particularly in the loins or across the epigastrium. The heart was sound; so too seemed the liver; and and there was only a slight catarrh. She had just ceased to nurse her child, and the milk flowed freely. The urine was scanty, dusky, cloudy when newly passed, acid, 1017 in density, and highly coagulable. She had a trivial fever, the pulse being 96, but small, and the skin dry, and in the night time hot. She was ordered bitartrate of potash, spirit of nitrous ether, and Dover's powder. In three days the œdema had disappeared without increase of urine. The sediment of the urine consisted of blood-discs (Figs. 2 and 3. *a*), degenerated epithelial-cells (*b*), epithelial nuclei (*c*), and casts of the uriniferous tubes (*d*), filled with the preceding substances, and seldom any oil-granules. The sediment was frequently examined afterwards, and presented little variety, except

FIG. 2.

Fig. 3.

in amount, and in presenting a few tube-casts consisting apparently of the fibrinous matrix alone (Fig. 3). The diuretics were then discontinued, and Dover's powder was administered twice a-day. Notwithstanding the opium, a tendency to diarrhœa occurred for four days after the 14th, but it was stopped by increasing the opium. The features having again become puffy, nitrous ether and oil of juniper were given; but, in consequence of the urine becoming more red and more coagulable, all diuretics were permanently abandoned. On the 20th, she began to complain of pain and tension of both eyeballs, and in the course of a few days the sclerotic of both eyes became very œdematous and swelled over the cornea; but this new affection was quickly removed by a zinc wash. On the 24th, vomiting before breakfast occurred for a few days, and diarrhœa threatened to return. Both affections, however, were arrested by morphia. Meanwhile a gentle perspiration had been maintained pretty steadily every night by Dover's powder. On the 27th the improvement was very marked in every respect. The pulse had become natural; there was no œdema; the urine, which had never exceeded thirty ounces, had a density of 1017, much less turbidity and brownness, and much less coagulability; and her sense of general comfort was greatly increased. Three grains of gallic acid were then ordered three times a day, but without seeming to pass by the urine, until the doses were doubled, when it was easily detected by the salts of iron causing a bluish-black precipitate. On the 6th March, the urine was forty ounces in quantity, 1015 in density, less turbid, and no longer red or brown. From this time there were occasional fluctuations, but on the whole an appreciable amendment, until the 31st March, when the urine presented very few tube-casts, little turbidity, and little albumen; but for three days the

potash test indicated the presence of some sugar, although the density was only 1012. On April 16th, there was only a mere trace of albumen; and on the 30th none. On the 16th May, she was dismissed. The albumen had never returned; the urine had been constantly clear, abundant, from 1019 to 1022 in density, without sugar and tube-casts. She had become florid, sufficiently plump, vigorous, and active, and she had the appearance of perfect health. I have not heard of her since.

Every circumstance here unites to prove this a case of subacute inflammatory desquamation of the uriniferous tubes. It may fairly be held an instance of complete cure, accomplished mainly under the influence of diaphoretics. Diuretics certainly seemed to be injurious, on at least one occasion; but this is the only instance in which these remedies have ever appeared to me to aggravate the symptoms. I have met with various cases of the same kind in the same circumstances, most of them equally favourable in the result. Another will be detailed under the head of the treatment.

Case 3.—To these I shall only add for the present one case of the other form of Bright's disease. Frequent examination of the urine constantly presented characteristic microscopic fields of oleiferous epithelial cells, and oleiferous tube casts. If the doctrine sketched above were good for anything, there could be no doubt of the intimate condition of the kidneys And accordingly they displayed, after death, appearances which Professor Gluge and Dr. Johnson themselves could not desire to see surpassed. The patient was a labourer, James Wood, aged 35, admitted into the surgical department of this hospital for necrosis of the left thigh-bone, but transferred to the clinical ward in a few days with coagulable urine and ascites. In November, 1849, while suffering for some weeks from pain along the left thigh and lameness, he was seized with rigors, in consequence of sitting in a chilly apartment without a fire. Swelling of the abdomen and limbs followed. Little further information could be obtained of the progress of his illness. When admitted into the infirmary, there was a sinus of the lower part of the left thigh, communicating with the necrosed femur. When received into the clinical ward, he had moderate œdema of the limbs, slight ascites, trivial catarrh, a sallow countenance, considerable emaciation, little appetite, much thirst, a frequent feeble pulse, and great debility. The action of the heart was barely audible, but otherwise natural. The urine was moderate in quantity, 1012 in density, without sediment, and distinctly coagulable. Dr. Bennett, who then had charge of him, relieved the catarrhal symptoms with squill and opium, and the dropsical effusions, first by Dover's powder, and afterwards by bitartrate of potash. But nevertheless he got constantly weaker and weaker, and became subject to vomiting in the morning, which bismuth, however, seemed to relieve. Soon after taking charge of the wards, I found him, on Feb. 7th, 1851, extremely weak, with a thready pulse, and coldness of the feet and hands. There was again anasarca of the legs, and now also of the scrotum, a little ascites, no great bronchitis, but a labouring respiration, and vomiting before breakfast. The urine was fifty ounces in quantity daily, 1015 in density, cloudy when just passed, slightly albuminous, and abounding in lithates and phosphates. It had been neces-

sary to order him both wine and spirit, on account of his extreme weakness. In a few days the urine was more carefully examined, when it was neutral, and free both of phosphates and lithates, but otherwise in the same state as before. The sediment presented many epithelial cells enlarged and gorged with oil-globules (Figs. 4 and 5, *e*); numerous

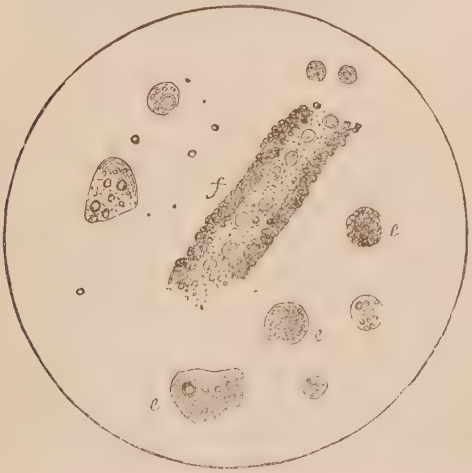
FIG. 4.

casts of the uriniferous tubes, entire or broken, and full of oleiferous epithelial cells and independent oil-globules (*f*); and also occasionally a few octaëdral crystals of oxalate of lime (*g*). On February 18th, as there was more œdema and dyspnœa, squill and digitalis were substituted for bitartrate of potash, and with the effect of increasing the urine. A mixture of chloroform and spirit of ammonia greatly relieved his breathing. Creasote often checked the liability to vomiting. But, although the urine was soon raised to 120 ounces daily, the dropsical effusions did not for some time recede. At length they began to give way. On March 7th he was every way better; and on the 20th, the urine having been for three weeks at 120 ounces daily, there was very little œdema of the limbs, no ascites, no catarrh, no vomiting, and a tolerable appetite; but still he remained very weak, and seemed to be picking up little strength, and no flesh. Afterwards a watery diarrhœa returned, and became gradually more and more attended with vomiting. On April 7th, both of these affections were urgent, in spite of acetate of lead with opium, catechu, morphia suppositories, and creasote. Consequently the exhaustion soon became extreme, and ended fatally on the 15th. For four or five days before death the urine did not exceed ten ounces daily, yet to the last there was no coma.

FIG. 5.

On dissection, the kidneys were found somewhat enlarged, their surface mottled with little vascular patches, their interior mottled irregu-

FIG. 6.



larly with deep grayish-purple spots on a light fawn ground, the medullary part highly injected. Opaque yellowish granular spots were visible on many parts of a longitudinal section. The fluid scraped from the surface of a section presented before the microscope oleiferous epithelial cells (Fig. 6, *e*), and oleiferous tube-casts (*f*), exactly like the sediment of the urine examined during life. Thin sections of the medullary part of the kidneys made with Valentin's knife, both in the direction of the uriniferous tubes (Fig. 7), and across them (Fig. 8),

Fig. 7.

showed these tubes everywhere gorged with oil-globules, while the malpighian bodies seemed free of such obstruction (Fig. 8, *i*). The super-renal glands were enlarged. The mesenteric glands had a bluish marbled appearance. The intestinal mucous membrane was everywhere thickened, and its folds were in many parts dark brown, but there was no ulceration. The spleen was enlarged and firm. The heart was rather small and pale, the endocardium opaque, the aorta atheromatous at its commencement. The lungs were somewhat emphysematous, and presented here and there, especially just under the pleura, nodules of condensed pulmonary tissue, about the size of a cherry stone, grayish-purple in colour, generally softened in the centre, and passing insensibly into the surrounding healthy texture. The left femur presented interesting appearances; but as they were those of necrosis generally, they need not be detailed here.

The appearances in this case were characteristically those of stearosis of the kidneys. I endeavoured to ascertain by chemical analysis, whether oil could be obtained from the kidneys in proportion to the microscopic indications. An accident prevented the weight of oil from being determined, but it was plainly much greater in proportion than in a comparative analysis of a healthy kidney. From the first the

symptoms presented a character of *adynamia*, which could not be referred to the necrosis merely, but seemed to betoken the presence of a malignant disease. The abundance of the watery part of the urine, and the facility with which it was very much increased, together with the want of oily degeneration of the malpighian bodies, rather favour the notion that these bodies are concerned less with the proper secretion of the kidneys than with the secretion of watery fluid.

Fig. 8.

Treatment.—The treatment of Bright's disease of the kidneys is partly directed to the removal of the fundamental disease, and in part to the cure of secondary diseases.

The main remedies for the fundamental disease are general depletion, topical depletion, local counter-irritation, diaphoretics, diuretics, and astringents. In acute cases general bloodletting is an essential measure, if there be decided general re-action; and in the young, robust, and plethoric it must be practised freely, as in ordinary acute inflammations. Local depletion is resorted to in subacute cases, or when the constitution is impaired, but, according to my observation, not with the advantage we might expect, unless its amount produces a general impression. Counterirritation of the loins is probably too little resorted to. It is improbable that any benefit can be derived from depletion and counter-irritation in stearosis, uncomplicated by inflammatory desquamation. In all cases, acute or chronic, stearotic or inflammatory, diaphoretics are of essential service. The best are Dover's powder, the warm bath, warm clothing, and, for convalescents especially, a moderately warm climate. Diaphoretics have always appeared to me most serviceable when they are so given as to excite a gentle perspiration during a part of the night. Diuretics are seldom necessary for the fundamental disease; but they are sometimes advisable when the urine becomes very

scanty, even although there is no dropsy; and they are undoubtedly the most certain and speedy remedy when the dropsical effusions are considerable. I am convinced that the fears entertained by some of injury being produced by the stimulus of diuretics on the kidneys are visionary. Case 2nd is the only instance in which I have ever witnessed any apparent harm; and in numberless instances, as in case 3d, I have seen dropsy quickly removed by diuretics, not only without increase of the other symptoms and secondary affections, but likewise with manifest improvement in them all. The stimulus caused by diuretics may well be supposed to differ entirely from the peculiar irritation which gives rise to inflammatory or stearotic desquamation; and in that case the induction of the one may not of necessity tend to induce, keep up, or increase the other. Besides is there no likelihood of advantage from diuretics sweeping out the tube-casts, and other matters obstructing the uriniferous tubes? The best diuretics, in my experience, are digitalis, squill, and bitartrate of potash taken simultaneously. Nitrous ether, broom tops, acetate of potash, oil of juniper, have seldom succeeded in my hands when the three former failed; but after all these had failed, I have seen diuresis speedily established by Hollands. I doubt whether astringents, even in chronic cases, are of the service which we might expect. I have seen a few cases, in which the albuminous impregnation ceased under the use of acetate of lead, or under that of gallic acid; but the good effects have not been so frequent as to entitle me to speak positively in their favour.

The treatment of secondary diseases does not materially differ from that which is applied to the same diseases in other circumstances. All of them are more difficult of cure when secondary to Bright's disease. Inflammations must be treated with activity in the usual way. I repeat that, after frequent careful watching, I can find no objection to the use of diuretics for removing dropsy, but quite the reverse; but in this affection we should avoid the cathartic plan, as being apt to excite a permanent diarrhœa; and mercury should be shunned as a mercurial on account of the facility with which in this disease it produces excessive action. The best remedy for the diarrhœa, which so often proves troublesome, and sometimes dangerous in Bright's disease, is the Edinburgh lead and opium pill, in the dose of five or ten grains twice or even thrice a-day; to which may be added, in severe cases, a fatty suppository of muriate of morphia. Vomiting may be sometimes removed by bismuth, but more frequently by morphia, hydrocyanic acid, creasote, pyroxylic spirit (medicinal naphtha), chloroform, or little fragments of ice; and when these fail, a blister over the epigastrium has sometimes succeeded. It is not necessary for me to say anything of the treatment of other secondary diseases. In all cases stimulant liquors should be used with caution; but they are sometimes unavoidable when the exhaustion is great. The diet, in the acute form, must be low, light, and farinaceous; but in the chronic form a moderate allowance of nutritive easily digested food, with a moderate use of liquids, has always appeared to me the preferable diet, when the patient can take it.

Bright's disease was long considered a very deadly one; indeed as generally fatal, sooner or later. This denunciation is probably true of

the stearotic form. But it is quite incorrect, if extended to the more frequent form of inflammatory desquamation.—*Monthly Journal of Med. Science, June* 1851, *p.* 551.

66.—*A Few Hints in Treating Urinary Affections.*—By Dr. Golding Bird, F.R.S., &c.—[Dr. Bird concludes his work on the above subject by the three following rules.]

1. Whenever it is desirable to impregnate the urine with a salt, or to excite diuresis by a saline combination, it must be exhibited in solution, so diluted as to contain less than 5 per cent. of the remedy, or not more than twenty-five grains in an ordinary draught. The absorption of the drug into the capillaries will be ensured by a copious draught of water, or any diluent, immediately after each dose.

2. When the urine contains purpurine, or presents other evidence of portal obstruction, the diuretics or other remedies employed should be preceded or accompanied by the administration of mild mercurials,—taraxacum, hydrochlorate of ammonia, or other cholitic remedies. By these means, or by local depletion, especially by leeches to the anus, the portal vessels will be unloaded, and a free passage obtained to the general circulation.

3. In cases of valvular disease, or other obstructions existing in the heart and large vessels, it is next to useless to endeavour to excite diuretic action, or appeal to the kidneys by remedies intended to be excreted by them. The best diuretic will, in such cases, be found in whatever tends to diminish the congested state of the vascular system, and to moderate the action of the heart; as digitalis, colchicum, and other sedatives, with mild mercurials.—*Brit. and Foreign Medico-Chirurg. Review, July,* 1851, *p.* 243.

67—OBSERVATIONS ON THE PHYSIOLOGICAL RELATIONS OF OXALATE OF LIME.

By Professor Lehmann.

Frequently as oxalic acid, combined either with the alkalies or with lime, occurs in the vegetable kingdom, (Schleiden, Carl Schmidt, and others,) it is very seldom found in the animal organism, at least in large quantities. It only occurs in the latter in combination with lime, never being present in sufficient quantity to combine with the alkalies as well as with lime. Moreover, it is much more frequently met with in pathological than in physiological conditions.

It is in the urine that the presence of oxalate of lime has been most frequently observed, it was for a long time regarded as a morbid product in this fluid; but independently of the circumstance that this body is constantly present, together with carbonate of lime, in the urine of herbivorous animals, it has frequently been found in normal human urine by myself, Höfle, and others.

In examining microscopically the morning urine of healthy men, I

have frequently discovered isolated crystals of oxalate of lime; this is not, however, always the case; and further, the oxalate of lime recognisable in such cases by the microscope, is not all that is contained in the urine, for it forms in larger quantities after some time, and during the acid urinary fermentation, so admirably described by Scherer. After allowing morning urine to stand for a considerable time, we often find a great many of these crystals, when the perfectly fresh urine presented no trace of them. The following is an excellent mode of demonstrating the existence of oxalate of lime in normal urine. If it be winter, we must expose fresh urine out of doors till it freezes; in this process, as in the freezing of wine and vinegar, a great part of the water crystallises in a comparatively pure state, and after its removal we obtain a concentrated saline solution, in which microscopic crystals of oxalate of lime may be discovered. That oxalate of lime is at first actually held in solution in filtered urine, and that it does not, as C. Schmidt supposes, proceed from the mucus of the bladder, is a view which is supported by the experiment which I have often repeated, that in urine, which after thoroughly cooling was freed from its mucus and urate of soda by filtration, the most distinct crystals of oxalate of lime might, after a time, be recognised, while no traces of them could either previously be detected in the mucus of the fresh urine, or found after the residue on the filter had been for some time in contact with water. The oxalate of lime, with a few crystals of uric acid, does not separate from filtered urine until after it has stood for some time. We may very easily convince ourselves that oxalate of lime is present in a state of solution, by extracting the solid residue of filtered urine with not too concentrated spirit, and agitating the spirituous extract with ether; after the extraction with ether, there may be observed, in the alcoholic extract, a sediment insoluble in water, which consists of the most beautiful crystals of this salt. While in the acid urinary fermentation the separation of the oxalate of lime increases with the augmentation of the free acid of the urine, in the latter case the salt is separated by the removal of the free acid.

The quantity of oxalate of lime in ordinary urine is so minute, that, till recently, chemists, from the want of sufficiently accurate means of analysis, were unable to recognise it; good analysts have, however, always found, in the insoluble part of the ash of the extract of urine, a little carbonate of lime, which, at all events, owes part of its origin to the oxalate of lime.

Crystals of oxalate of lime are most frequently found in the urine after the use of vegetable food, especially of such kinds as contain ready formed oxalates, (Wilson.) Donné found that after the use of sparkling wines, the quantity of the salt is increased in the urine; and my own experiments show that there is an increased secretion of oxalate of lime after the use of beer containing much carbonic acid, and of the alkaline bicarbonates and vegetable salts. I cannot confirm Bird's view, that highly nitrogenous food causes a precipitate, or even an augmentation of the oxalate of lime. It is often found in the urine of pregnant women. (Höfle.)

From a series of direct experiments on the subject, C. Schmidt is led to deny that oxalate of lime introduced into the stomach, passes into the

urine; and in this point I can perfectly confirm him, without, however, going so far as to assert that the food exerts no influence on the formation of this body. In the excrements of caterpillars we often find much oxalate of lime which is not formed directly from the ingesta, since I have very often found the crystals in the biliary ducts of these animals. Preparations can be easily made of these organs; and in consequence of their contractility, a large quantity of their contents may be expressed from the cut tubes, and submitted to microscopic examination.

With reference to the occurrence of oxalate of lime in certain morbid conditions, Prout, Bird, and others, make very different statements, none of which are yet fully established. Numerous examinations of morbid urine have convinced me, that in this country, at least, the sediments of oxalate of lime are much rarer than they are represented to be by English writers. These investigations have led me to the following results: when the respiratory process is in any way disturbed, we most frequently observe a copious excretion of oxalate of lime; it is most common either in fully developed pulmonary emphysema, or when the pulmonary tissue has lost much of its elasticity after repeated catarrhs; on the other hand, it is not present nearly so often in inflammatory or tuberculous affections of the lungs, (Höfle); moreover, it is common in convalescence from severe diseases, as, for instance, typhus, mucus-corpuscles being then often associated with a trifling sediment of oxalate of lime. I have only met with actually pure sediments of this salt in three persons, who sometimes (at somewhat considerable intervals) suffered from epileptic attacks. It is by no means constant, according to my experience, in the urine of rachitic children (Simon), of gouty adults with osteoporosis, of women with leucorrhœa, of patients with heart-disease, or in urine containing semen. (Donné.)

In the dyspeptic conditions in which Prout and Bird have found sediments of oxalate of lime, I have failed in discovering anything of the sort; on the contrary, I have generally found the sediments in the urine of such patients to be free from these crystals. The reason why the English have so often found this salt in the urine, may be, that in England (as we shall further notice at a future page) the urine is generally in a more concentrated state than in Germany; and as Bird very correctly remarks, oxalate of lime is more rapidly separated from a concentrated than an aqueous urine. Moreover, experience at the bedside teaches every unprejudiced observer, that the appearance of oxalate of lime in the urine, is by no means accompanied by the group of symptoms which certain English physicians describe as pertaining to what they call the oxalic diathesis.

That the mulberry calculus consists for the most part of oxalate of lime, has been long known; but most other urinary calculi, whether they consist principally of earth or urates, almost always contain a little oxalate of lime.

This salt has only rarely been found in other places besides the urine. C. Schmidt has remarked that it is often present in the mucus of the gall-bladder, and that it is scarcely ever absent from the mucous membrane of the impregnated uterus. I once discovered oxalate of lime in

expectorated matter; but whether it was produced from the pulmonary mucus, or from fragments of food in the mouth, I could not decide.

Origin.—As the use of vegetable food, of which many varieties contain oxalates, increases the quantity of oxalate of lime in the urine, the inference would seem a legitimate one, that the oxalates are transmitted from the food to the urine. The source of this salt must, however, not be sought for only in the preformed oxalates, but in the amount of alkalies in combination with vegetable acids present in the food; for, as we have already mentioned, they induce an augmentation of the oxalate of lime. In all the well-marked cases to which I have alluded, the increase of the oxalate of lime seemed to be combined with disturbance of the respiratory process. Thus it may easily be understood why, after the use of drinks rich in carbonic acid, of alkaline bicarbonates, or vegetable salts, oxalic acid is increased in the urine; the superfluous carbonic acid which has entered the blood, or been generated there from the salts of organic acids, must obstruct the absorption of oxygen and the perfect oxydation of certain substances in the blood; hence also the quantity of oxalate of lime has been found to be increased by the partially impeded exchange of oxygen and carbonic acid in the lungs, consequent on emphysema, pulmonary compression during pregnancy, &c. We might, in such cases, assume, according to a formerly prevalent belief, that the kidneys in some degree acted vicariously for the lungs, since under the form of oxalic acid they remove from the organism the carbon which the latter organs would have excreted as carbonic acid.

Although certain chemists hold a contrary opinion, it is an undoubted fact that the nervous system has an influence on the oxydation of the blood. The occurrence of oxalate of lime in cases of epileptic convulsions, in convalescent persons, &c., might be referred to the disturbance induced in such cases in the nutrition or in the function of the nervous system, and to its diminished influence on the process of respiration, without there being any necessity for the assumption of a special diathesis.

It seems, moreover, unreasonable to set up such a diathesis, since the establishment of a special disease from a single symptom—that symptom being only the occurrence of oxalate of lime—is entirely opposed to the spirit of rational medicine.

From Wöhler and Liebig's discovery, that uric acid is decomposed by peroxide of lead into urea, allantoin, and oxalic acid, it has been pretty generally assumed, that the oxalic acid of the urine is due to an oxydation of the uric acid; the oxalic acid, in this case, not being converted into carbonic acid, as usually occurs in the healthy organism. That the formation of oxalic acid may be in part thus explained, is unquestionable; but there are many other substances in the animal organism besides uric acid, which by oxydation yield oxalic acid. No definite numerical ratio between the uric acid, urea, and oxalate of lime in the urine, has been yet established.

C. Schmidt has propounded a very ingenious view regarding the origin of oxalate of lime in the urine. He believes that we must seek for the source of its secretion in the mucous membrane of the urinary passages; the oxalate of lime is first produced by the decomposing action of the

acid urine on a soluble compound, oxalate of albumen-lime, secreted by the mucous membranes; for oxalate of lime as an insoluble body, could not penetrate with the urine through a series of renal cells; oxalate of lime is also formed from the mucus of the gall-bladder by this mode of decomposition. When oxalate of lime occurs in the urine, we always find an augmentation of the mucus. These reasons do not, however, appear to be so decisive as to induce us to exchange the view we have already given for that of Schmidt; and, indeed, in another place, we find Schmidt himself maintaining that the urea is in part combined with oxalic acid.—*Brit. and For. Medico-Chirurg. Review, July*, 1851, *p.* 152.

68.—*On the Means of Testing for Urea in Albuminous Fluids; and on the Origin of Urea.* By PROFESSOR LEHMANN.—Urea may generally be very easily recognised by its properties, especially by its behaviour towards nitric and oxalic acids; but when we have to discover very minute quantities of this substance in albuminous fluids, it is often very difficult to determine its presence with scientific precision. It is in alcoholic extracts that we must always seek for urea; but before we proceed to search for it, there are several precautionary measures to be adopted, the neglect of which would render our attempt to discover it futile. In the first place, in reference to the presence of albuminous substances, if we wish to discover small quantities of urea in albuminous fluids, we must not be satisfied with the removal of the albumen by simple boiling; since, by the coagulation of the albumen, the fluid becomes more alkaline, and might, during evaporation, induce a decomposition of the urea; moreover, all albuminous matter is not precipitated by boiling, but a portion remains dissolved by the alkali, and is taken up in the alcoholic extract. On evaporation, this albumen undergoes a change, which probably cooperates with the alkali in inducing the decomposition of the urea. This may explain how it was that Marchand could only recover 0·2 of a gramme of urea from a mixture of 200 grammes of serum and 1 gramme of urea. Hence, before boiling the albuminous fluid, we must add a few drops of acetic acid, so as to give it a slightly acid reaction, whereby not only is the alkalescence of the fluid prevented, but a much more perfect separation of the coagulable matters is effected. If the residue of the fluid from which the coagulated matters have been filtered be extracted with cold alcohol, and the solution rapidly evaporated, so as to cause the chloride of sodium (taken up by the cold alcohol) to separate as much as possible in crystals, on then bringing a drop of the mother-liquid in contact with nitric acid under the microscope, we shall observe the commencement of the formation of the rhombic octohedra, and the hexagonal tablets, in which, if the investigation is to be unquestionable, the acute angles (=82°) must be always measured. After the determination of the nitrate, we may also obtain the oxalate, and submit it to microscopic examination. A good crystallometric determination yields, however, the same certainty as an elementary analysis, which, in these cases, would never or extremely seldom be possible.

The investigations of Marchand have thrown much light upon this subject [the seat of the actual formation of urea]. This accurate observer could only recover 0·2 of a gramme of urea from 200 grammes of serum, to which 1 gramme of urea had been added. He shows that, even if the urea were only separated from the blood at the end of each successive hour, it could not have accumulated in such quantity as to have been discoverable by the present mode of investigation. The following consideration will give us an idea of the small quantity of urea which, according to Marchand's hypothesis, at the most can accumulate in the blood in one hour:—From the experiments of Ed. Weber, which I have in part confirmed, we may assume that there are, in an adult man, at most 6 or 7 kilogrammes [16 to 19 pounds] of circulating blood. Now, if, in twenty-four hours, 30 grammes of urea are discharged, at most only 1·25 grammes could accumulate in one hour in the whole mass of the blood; so that only 0·021% could be contained in it. This minute quantity can, however, as we have already shown, only be detected in operating on very large masses of blood and by the aid of the microscope. Hence it is easy to understand why, during my experiments with an animal diet, while the urine was loaded with urea, none of this substance could be discovered in the blood.

If it be now established that the urea is not primarily formed in the kidneys, the question still remains to be answered, whether it is produced in the circulating blood or in the individual living organs, (as, for instance, the muscles,) and from what materials it is principally formed. In the present state of our knowledge, we may answer, that the urea is formed in the blood, and that it is produced from materials that have become effete, the detritus of tissues, as well as from unserviceable and superfluous nitrogenous substances in the blood. No animal tissue presents such vital activity, is so much used, and is so rapidly worn out, as muscular tissue; it is in this tissue that the metamorphosis of matter proceeds most rapidly and abundantly; and yet, in the large quantities of muscular fluid on which Liebig worked, he could detect no trace of urea, although he found substances from which he could produce urea artificially. We must therefore assume, that these substances, as creatine and probably inosinic acid, are decomposed in the blood, by the action of the alkalies and of free oxygen, into urea and other matters to be excreted. Moreover, my experiments, showing that the superfluous nitrogenous food which enters the blood, and the fact that caffeine, glycine (Horsford), uric acid, and alloxantin (Wöhler and Frerichs), soon after they have been taken, perceptibly increase the amount of urea in the urine, support the view that urea is formed in the blood. It is impossible to suppose that this nitrogenous food is first converted into tissue, and subsequently into urea, &c.; for we cannot think that a process occurs here, analogous to that exhibited by the percussion-apparatus of the physicists, where a certain number of parts effecting a percussion give rise to the repulsion of an equal number of parts. Hence the conversion of this matter can occur in no other place than in the circulating blood, and therefore it is here that the urea must be formed.

That the urea is formed from nitrogenous matter could not be doubted, even if it did not contain nitrogen (and that in so large a quantity); for

it is especially after the use of highly nitrogenous food, that we find an augmentation of its quantity in the urine. If, however, we should further inquire,—from what substances it is produced, and what tissues principally contribute to its formation?—we could not, in the present state of our knowledge, give any satisfactory answer to this question. All that we know is, that urea is a very general product of the decomposition of nitrogenous matters, both naturally within the animal body, and artificially in the laboratory of the chemist. We have already said enough to show, that urea is so common a product of the decomposition of nitrogenous bodies, that we could hardly any longer enumerate it among true organic substances, if we tried to establish a distinction between organic and inorganic matter. Moreover, when we treat of uric acid, we shall show, that, in all probability, a great part of the urea separated by the kidneys from the blood is the product of the decomposition of that acid.—*Brit. and For. Medico-Chirurg. Review, July*, 1851, *p.* 164.

69.—*On the Quantity of Phosphoric Acid existing in healthy Urine.*—By Dr. D. Breed.—Notwithstanding the importance attached to every increase of our knowledge relating to physiology and pathology, an extended examination of the quantity of phosphoric acid in the urine has not been hitherto carried out by either a chemist or physician. A method, given by Professor Liebig, for determining phosphoric acid accurately and quickly, enabled the author to supply this deficiency, and to elicit some facts which may be of importance in the treatment of diseases.

This method consists in treating the urine with a solution of known strength of perchloride of iron until a small quantity of the mixture, when filtered and tested with ferrocyanide of potassium, gives a blue colour. It is based upon the fact, that a liquid containing phosphoric acid, both when neutral and when acidified with acetic acid, yields an insoluble precipitate with a solution containing peroxide of iron. The solution of perchloride of iron is best prepared by dissolving 15·556 grms. of iron in muriatic acid with the addition of nitric acid, evaporating to dryness in the water-bath to remove the excess of acid, and then dissolving the remaining salt in 2000 cub. centims of water. One cub. centim. of this solution precipitates 10 milligrms. of phosphoric acid. Instead of this solution of perchloride of iron, one of indefinite concentration may also be used, the strength of which may be ascertained by testing with a solution of phosphate of soda, the quantity of phosphoric acid contained in which is known. The solution of perchloride of iron used must be perfectly free from the protochloride.

If the urine, the amount of phosphoric acid in which we are about to determine, has acquired an alkaline re-action from the decomposition of the urea, a portion of the phosphoric acid may have been precipitated in combination with lime or magnesia, and the precipitate must then be dissolved by the addition of a few drops of muriatic acid. The urine is measured and well shaken; a measured quantity, about 100 cub. centims.

(or more) is drawn off with a pipette, and placed in a beaker, and acetate of soda (in considerable quantity if muriatic acid has been added) and acetic acid are added. The solution of the perchloride of iron is then cautiously added, and the mixture is frequently tested to ascertain if all the phosphoric acid is precipitated, until a trace of the iron solution has been added in excess. To detect the latter, a piece of filtering paper imbued with ferrocyanide of potassium is placed upon a white porcelain surface (or upon a glass plate with a piece of white paper lying beneath it), and a doubled piece of filtering paper pressed against it with a glass rod, from which a drop of the urine is hanging; if the urine contains an excess of the solution of iron, a blue colour is produced within from three to four seconds. The quantity of the solution of iron used is noticed. Two other portions are treated in exactly the same way; if the results agree, the quantity of solution of chloride of iron which would have been required for the entire quantity of urine is calculated, and the amount of phosphoric acid corresponding to this quantity of the solution of iron is contained in the urine, and is then ascertained. By this method, a physician who has but little spare time, can easily make several determinations of the phosphoric acid in urine every day.

The quantity of phosphoric acid in the urine of a man in health, and living a regular life, is nearly constant; but recent experiments have shown that the mode of living, as also diseases and medicines, cause a variation in the amount of phosphoric acid in the urine.—*Monthly Journal of Med. Science, October,* 1851, *p.* 368.

70.—*Conditions of the Urine as Indicative of the State of Disease.*—[The following valuable remarks on the state of the urine are made by Dr. Dick, in considering the subject of dyspepsia.]

Urine which immediately on being voided gives out a sensible smell of ammonia, generally indicates that the vital powers have suffered declension; that disease has become chronic; that the patient is past middle life, or is prematurely aged, &c.

In arthritic and rheumatic cases, the mineral and vegetable acids are carefully to be shunned. Among the latter the oxalic is the most objectionable; next, the malic; then, the tartaric, citric, and acetic. There can be little doubt that these acids act injuriously by their astringent effect on the cutaneous and mucous surfaces, by their thus interfering with their own elimination and that of the uric and lactic acids; thereby loading the blood with acidulous principles; whence follows that peculiar irritative condition of the nerves, constituting local affections, such as sciatica, lumbago, gout, or the systemic disturbance of rheumatic fever. It is amazing how difficult it is to rid the blood of this acidulous diathesis (if the expression may be used) when once it has been formed. The excernents seem to find it a peculiarly hard task to eliminate acids. Years of rigid attention to the dietetic ingesta are necessary. Hence the rarity of radical cures of gout and rheumatism.—*Lancet, August* 2, 1851, *p.* 103.

SURGERY.

DISEASES OF JOINTS, FRACTURES, &c.

71.—ON INTERNAL DERANGEMENT OF THE KNEE-JOINT.

By Samuel Smith, Esq., Senior Surgeon to the Leeds General Infirmary, &c.

[At the commencement of a clinical lecture upon this subject, this able surgeon draws attention more particularly to a peculiar affection of the knee-joint, because it is a condition which may be often overlooked. He remarks that it was in Leeds that the nature of the injury was first noticed, and the mode of cure described by the first William Hey, in his 'Practical Observations on Surgery.' Mr. Smith proceeds:]

In this accident, in consequence of some slight fall, slip, or sprain, the mechanism of the knee-joint becomes so far deranged, that the *full* extension of the limb is rendered impossible, either by the muscular efforts of the patient, or by the assistance of another person, unless the manœuvre I shall presently describe be first practised; the person walks with a limp, sometimes with much pain, and sometimes without; the great peculiarity of the gait is, that he walks with an imperfect extension of the leg; the knee remains constantly a little bent. In some instances the cure takes place suddenly and accidentally; in others it will continue for days, weeks, and months, and in such cases, I believe, sometimes lays the foundation for serious disease of the knee-joint. If we have an opportunity of examining the joint in a recent case of this injury, the eye will detect little alteration in its appearance, there will be no swelling or effusion, no pain when the limb is at rest; we ascertain that in our attempt to extend the limb, the ligament of the patella is not rendered tense, it is relaxed. This I believe to be in consequence of that singular consent of parts which is sometimes required; the powerful muscles inserted into the patella here refuse to act with vigour, in consequence of the pain which would be produced by such action to its full extent.

Mr. Hey says,—"An unequal tension of the lateral or cross ligaments of the joint, or some slight derangement of the semi-lunar cartilages, may possibly be sufficient to bring on this complaint." I am not aware that an opportunity has ever taken place where this matter could be set at rest by a dissection of the knee-joint in such a case. If the lateral or cross ligaments only were out of position, it is natural to suppose that

the mere act of walking would at once replace them; my own suspicion is that the edge of the semi-lunar cartilage is turned upwards.

Case.—Henry Gray, of Calverley, nine years of age, came to the Infirmary, Jan. 30, 1850; six days previously, while running, he had been tripped up by another boy, and fell; he became lame. When he came to the Infirmary, his gait convinced me at once it was a case of internal derangement of the knee-joint; he walked without extending the leg properly, and in consequence of the misplacement having happened six days previously, there was some degree of effusion in the joint. I placed him upon the sofa, flexed and extended the leg, by which means he was somewhat better, but I did not feel satisfied that it was put quite right. His mother refused to allow him to remain an in-patient, and I refused to take the responsibility of the case, unless he was under my immediate inspection as such; she then consented, and he was sent to bed. When I saw him again, I repeated the manœuvre, with more success, for when I had obtained the full and complete flexion of the limb, I tied a towel round the ankle and upper part of the thigh, and desired him to lie on his side in this position until I had visited my other in-patients. In thirty or forty minutes I saw him again, suddenly extended the limb, and it was evident the joint was now in correct apposition, but the flexors were permanently contracted. This state of those muscles was corrected by placing the heel upon a doubled pillow, and a sand-bag above and below the knee. In a few hours he was perfectly well, and free from pain and lameness; there was still a little effusion, but that gradually disappeared, and he returned home well February 6th.

From my experience in such cases, I feel confident if this case had been treated on the first or second day of the accident, the cure would have been immediate and perfect; but the six days had complicated it with effusion into the joint, and permanent contraction of the flexor muscles.

Now, with respect to the frequency of this accident: I have now been surgeon to the Infirmary above thirty-two years; I think I have been rarely a year without seeing a case, and I am sure I have seen as many as three or five cases in a year. I therefore conclude, that if, in any large hospital in this country such cases are not seen and noted, they are overlooked, and, I fear, in many instances permanent lameness is the consequence.

On Friday evening last I was at a musical party, and at tea I sat next to a surgeon who was a member of the musical society. We had some conversation on this subject, and I mentioned this opinion to him; he coincided with me, and mentioned a case in point, with which case I was so much pleased, that I obtained his permission to make it known to you. Before I mention this case, I may remark, that an empiric, or a man quite ignorant of his profession, is never known to confess an error, but you will find the most enlightened, and those possessed with the most thorough knowledge of the profession, always ready to do it. Here is the case written down for me by Mr. Samuel Hey:—

"On July 3rd, 1847, I was called to attend Mr. Robert Swan, a respectable tradesman in this town, who had suffered a dislocation of the

ankle; he was confined to bed six weeks, and afterwards used crutches for a length of time.

"At the beginning of December in the same year, as he was reaching something down from a shelf, he twisted the knee of the sound limb and became immediately lame.

"I saw him on the 6th of December, and found symptoms of inflammation of the synovial membrane, with effusion to a considerable amount. Antiphlogistics were then used, and on the 8th a large blister was applied, which, together with rest, reduced the swelling; still the lameness remained, the patient walking on the toe, with the knee bent, and with great difficulty.

"On the 16th, at least ten days after the accident, as I was leaving the house, I suddenly suspected that this might be one of the cases of derangement of the cartilages of the knee-joint described by my grandfather. I returned, made forced flexion several times, when the patient declared he was well, threw aside his stick, and walked about the room with perfect ease. On the 18th I applied a plaster and bandage, and took my leave."

There are some individuals, who after once having had this accident may be said to become liable to it. Mr. Hey mentions the case of a gentleman who suffered from it three times, and a lady twice. I have had a case of this kind in a young lady, which interested me much, and having recently seen her I requested her to put down in writing her own recollection of the circumstances, for I am sorry to say I have not committed one case of this kind to paper. Here is her letter.

"My dear Sir,—Since you wish for an account of the weakness of the knee-joint that I was subject to some time ago, I send you the particulars as far as I recollect. My knee was perfectly strong previous to the first accident I had, which was at the age of thirteen or fourteen. I was at the dancing school, and having been reprimanded for not turning out my toes sufficiently, was told to stand at one end of the room with the toes violently turned out. I stood up, forced the heel forward and the toe back, still it was not according to the dancing-master's ideas of grace, who told me to turn the toes out still more, and in making the effort to do so, I felt something give way in the left knee, and I fell to the ground. I was assisted up and out of the room; after resting half-an-hour, the dancing lesson being over, I managed to limp home, which was at no great distance. I did not wish any one at home to know that I was lame, as I was going that afternoon to spend a week in the country, and I thought my visit might be prevented. The carriage was at the door when I got home, so I had no difficulty in concealing my lameness until I arrived at the end of my journey. There I remained a week, occasionally using my leg, but never able to walk without limping. The pain was not great unless I attempted to straighten the leg, in which I was unsuccessful. At the end of a week I returned home and you were sent for. You put my leg right during the first visit, by bending it backwards and suddenly forwards. I could then walk perfectly, but felt the joint weak and liable to fail. I had a similar accident a few months afterwards, and, during the course of four or five years, I must have suffered from it at least six times, and on one occasion twice in the

course of one day. On each occasion (excepting the first) you were at hand to give me relief. About seven years after the first time my knee went wrong, I had another accident with the same knee. I was staying with a friend in the country, and as we were undressing at night, my handkerchief being on the floor I took it up with my foot instead of my hand, and placed it on the pillow. This feat required the leg to be in an unnatural position, and I felt the knee give way at once. I fell across the door-way, and groaned in agony for a minute; on looking down at the leg, I saw some of the bones were displaced, and thought the best plan would be to try and straighten the leg, so I resolutely pushed it straight, though suffering much pain. Immediately the leg was straight, the bones seemed to regain their places with a snap, and the pain having gone as instantaneously, I concluded all was right. My friend assisted me into bed. The next morning you were sent for. I was obliged to keep the sofa for ten days, after that I wore a laced knee-cap by your recommendation, for some months, and now my leg is perfectly strong, and for a few years it has felt much stronger than it has ever done before, since the first time I injured it."

The only remark I will make on the above case is, that the last accident was a lateral dislocation of the patella.

I recollect another very striking case of this kind. One Friday afternoon, fifteen or twenty years ago, when seated at my table, examining the patients for admission into the Infirmary that week, my attention was suddenly directed to a middle-aged man walking into the room with a stick, and with that peculiar gait which at once said to me before a word was spoken, "internal derangement of the knee-joint." He had slipped and fallen ten days before; had had surgical advice without benefit for a week, when he obtained a recommendation to the Infirmary; he lived four miles off, and he said he had been four hours in walking that distance. Finding all the circumstances to agree with former cases of this kind, I placed him upon his side, performed the full flexion and sudden extension of the limb, and to my great gratification the limb was found to be quite right, and he walked well instantly. Well, I was proud of the case, and felt that I had another feather in my cap, and so, instead of sending him to the board-room as usual to be admitted a patient, I admitted him a patient, discharged him cured, and he returned thanks to the board for his cure, all within ten minutes. I, however, requested him to inform me in a week or two of the conclusion of the case: he came, and his words upon inquiry, as nearly as my recollection serves me, were—"Sir, I had not got one hundred yards from the Infirmary before I threw away my stick, walked home as if nothing was the matter, and have been well ever since."

I have met with surgeons who have not believed in this statement of Mr. Hey, and they would explain the last case thus:—"Oh! there was a ligamentous adhesion in that case, and by your full flexion and extension of the joint, you broke it up, and thus effected a cure." I think, if such had been the case, the cure would not have been so perfect and so sudden. But how can those cases be explained where the derangement and the cure take place twice in the same individual within a few hours? Mr. Hey gives such a case, and my young lady, whose letter I have read,

had it on one occasion twice on the same day. I usually manipulate the case in this manner, but as a plain description in words only without an example, is often soon forgotten, we will have Thomas the porter on the table, and make a patient of him, —you will thus have an opportunity of seeing the manner, as well as hearing the description,—it will then not easily be forgotten. If the right knee be the one affected, I place the patient at length on a sofa on his left side. I then take hold of the right ankle with my right hand, and by slow and gentle means gradually flex the limb till the heel presses upon the buttock; now is the time that a little cunning and art is required to perform the full extension, for if you attempt this without manœuvring properly, you are foiled, the muscles resist the action, and you can only succeed by cheating them.

I now take care the patient does not see what I am about; I place the left hand above the knee, grasping the vasti muscles, hold the ankle above the heel with the right hand, make several gentle extensions, but no further than to a right angle, and when my patient seems fully impressed with the belief that I am going to proceed no further, when I am satisfied I have caught him off his guard, I suddenly and powerfully perform the full extension of the limb. Generally I succeed, sometimes I fail, and have to repeat it once or twice. When the full extension is accomplished, the cure is usually complete.*

If the case be one of several days' standing, and there be any degree of inflammation or effusion in the joint, (which may be told by the swelling), it is best to confine the patient to bed for a day or two after the reduction, for in such a case, without care, the displacement might take place again. I hope, from the simple statement I have made, if one of these cases should come under your observation you will be able at once to detect and remedy it.

You will remember we were prevented succeeding immediately, in the case of Henry Gray, in consequence of the contracted state of the muscles at the posterior part of the thigh, which state was controlled by placing the heel upon a pillow, and a weight above and below the knee. This reminds me to make a few observations to you upon a subject which has had great interest with me, for you will find whatever disease or accidents a medical man has himself suffered from, that disease is ever afterwards one of great interest to him.

On Permanent Involuntary Contraction of the Muscles.—In the winter of 1810, whilst residing in the house of the late Sir Charles Bell, in Leicester-street, Leicester-square, I was suddenly awakened in the middle of the night by the sound of the watchman's rattle, and the cry of "Fire! Fire!" I took no notice until I ascertained that a crowd was collecting under my own window; then I arose, opened my window, which was to the front, and ascertained that within thirty yards, at the

* Since this lecture has been delivered, I have been favoured with the following paragraph by Mr. S. Hey:—

"Where immediate success does not follow this plan, especially in cases of long standing, it has been recommended to flex the leg fully, placing the arm under the popliteal space as a fulcrum, to separate, as far as may be, the head of the tibia from the condyles of the femur, and at the same time produce rotation of the tibia. This has been successful."

top of the street, and in full view, the Mexican Hotel was on fire; presently a lower window was thrown open, and a gentleman in nightcap and nightshirt leaped on the pavement. In a minute or two afterwards came from the same window clouds of smoke, and sheets of bright flame; then I noticed three women creeping on the roof, with nothing on but their night-dresses; these escaped into a neighbouring coachmaker's premises: soon afterwards every window was broken up by the heat; fire and smoke issued; there was no help, nothing could be saved, and, alas! several persons were burnt to death in their beds. Now, gentlemen I have told you that old tale because I think I picked up a little good surgery out of that fire, and here is my first case:—

It was a bitter cold, drizzling winter's night. I was so fascinated by what I saw, that I did not leave the window to put on even a stocking or a shoe. I remained full twenty minutes with my head out of the window, and my right forearm bent to a right angle resting on the window-sill. When I saw all was over, I retired to bed, cold and shivering. Before I proceed, I must tell you that at this time I was twenty years of age, and had a pet biceps muscle, which I was cultivating, and which (like many medical students of the present day whom I could name) I was very proud of. When I had been in bed some time, and wished to place myself in a proper posture for sleeping, I found the biceps muscle of my right arm was in a state of powerful involuntary and permanent contraction; the more I tried to overcome it, the more it mastered me. It was in open rebellion to my will, and a sturdy rebel it was with its two heads. I tried to coax it, and I found the soothing system answered best. I rubbed it, and gradually got it extended and easy; but when the limb was placed in a flexed position it suddenly got again into powerful contraction. After suffering a long time, I called up my esteemed friend, Mr. John Shaw, who was then my fellow-student; with his assistance I succeeded again in obtaining full extension of the arm, and was quite easy; but I had suffered so much from its frequent return, that I was determined to prevent a relapse by lying with the whole weight of my body upon the arm when extended. I fell asleep in this position, and awoke in the morning perfectly well. It was many years before I had an opportunity of reaping advantage from the experience gained that night in the management of a case of permanent involuntary contraction of the muscles; but my next case was a very striking one, by reason of the very long-continued contraction and the suddenness of the cure.

Mary L——, a stout, robust woman, aged twenty-five, from Normanton, (at that time a rural village, but now an important railway station,) was admitted a patient of the Infirmary, under my care, on the 30th of July, 1820. She had been fifteen months under treatment, suffering much, during the whole time, from permanent involuntary contraction of the four powerful muscles forming the quadriceps extensor femoris, the whole of which were in an extremely rigid state. She walked without pain, but an inability to bend the right knee in the least gave her the appearance of walking with a wooden leg; and during the whole of this time she had been unable to kneel. The warm bath, fomentations, frictions, and many other means, had been persevered in, for a great length

of time, without producing the least effect upon her complaint. In reflecting upon this case, I persuaded myself that this state of the muscles had originally been produced from some such cause as my own case, and that it was now continued through force of habit. I also thought, if I could succeed in completely relaxing these muscles, and keep them in that state a few hours, the balance of power between these muscles and their antagonists, the flexors, might probably be restored; and thus a cure effected. I proceeded to try this plan the following morning. I placed her upon the bed on her left side, and taking hold of the ankle with my right hand, grasping the thigh with my left, in the course of about ten minutes I succeeded in drawing back the heel, and pressing it against the buttock, thus producing a perfect flexion of the limb. This was not accomplished without considerable management, for the muscles made many attempts to overpower my efforts; but whatever degree of relaxation I obtained, I did not yield: but by gentle friction, and perseverance, my object was at last gained. It was gratifying to perceive that the rigid muscles became now perfectly relaxed. In order to destroy the tendency to reaction, two leather straps, with buckles, were placed, while the limb was in this position, tight round the upper part of the thigh and ankle, thus fixing the limb in this position, with the heel touching the buttock. She remained, by my orders, bound in this manner, and lying upon her side, until my visit on the following day, upwards of twenty-four hours. The success of my practice was perfect. On being released, it was found the muscles, which had been for so long a period contracted, were quite relaxed; and not only so, but the tendency to involuntary contraction was entirely destroyed. She walked without limp, without pain, and with the perfect action of the hinge of the knee-joint during every step she took. Suspecting, however, it might return, she remained an in-patient ten days. No return of the complaint took place. She was made an out-patient and appeared as such.

Aug. 30th.--She was perfectly well, and had suffered no relapse. She brought with her a letter from her surgeon, requesting to be informed of the means which had been adopted for her cure, which I communicated to him.

Oct. 4, 1846.—I received a letter from the late Mr. Spink, requesting me to meet him in consultation, on a case at Tollstone, near Tadcaster. I found Master S——, a fine boy of seven years of age, had been twelve days confined to bed and the sofa, in consequence of a blow he had received on the body from a playfellow at school. Considerable pain took place, he was put to bed, and the usual remedies applied. When I saw him, he was lying on his left side, with the knees drawn towards the abdomen; he was in much pain, had been twelve days quite unable to put his foot to the ground, or alter the position of the foot, without acute pain; and it was suspected that there was some acute disease of the hip. After examination, finding some of the abdominal muscles and also those of the thigh in a painfully contracted state, I rubbed them, and, by gentle means, gradually brought down the thigh. I then gently pushed back the chest, and in five or ten minutes I ascertained that the painfully contracted muscles were relaxed and also at ease.

I now took my patient in my arms, and placed him on the floor with the left leg foremost, ascertaining that in this position the muscles still remained relaxed, I left hold of him and confidently requested him to walk;—to the great surprise of his surgeon, and gratification of his father and mother, he walked well, and at ease, without limp or lameness. The cure was immediate and perfect, and no relapse took place.

I will not occupy your time by relating more of these cases; you will believe me when I say, I meet with them frequently, and many of you have had opportunities of seeing them in my practice. It is now more than twenty years ago since Dr. Williamson requested me to give him a short essay on some practical subject for the 'North of England Medical Journal;' I gave him this subject, it was published in the second number of that journal, and from thence inserted entire in 'The Lancet' and the 'Medical Gazette.'

Whatever muscles you find in this state, let it be your object to place their origin and insertion as far apart as possible; this secures a relaxed condition of them; maintain them in that state for some time, their opponents will then be gaining strength, and the balance of power will be restored. I often see the masseter in this state, and cure it by the gentle insertion of a wedge into the mouth. It is this state of the sterno-cleido mastoideus which forms wry-neck, and I have several times succeeded in effecting a cure in recent cases by turning the chin to the opposite side, and keeping it there a few days by mechanical means. The muscles about the shoulder-joint often get into this state after accidents, and render the arm of very little use for months and sometimes for years. This state of the shoulder I have often cured by the same manœuvre formerly mentioned, placing the bend of the elbow on the crown of the head, with the fingers touching the ear on the opposite side, and keeping it in that position a few hours. The biceps sometimes remains for some weeks in this state after treatment for fracture of the forearm; the muscles of the fingers also, after injuries of the hand. The powerful extensor or flexor muscles of the thigh after long-continued, extended, or bent position of the limb in the treatment of fractures or other injuries, are left in this condition. The gastrocnemii and other muscles of the leg are often allowed to get into this state during the treatment of diseases or accidents of the foot or ankle, and often require more management and time to remedy after the cure, than the original disease.

More than thirty years ago I often suffered from a painful spasm of some small muscle under the angle of the jaw, which I believed to be the digastricus. On one occasion I accidentally ascertained that the pain was instantly relieved by opening the mouth wide, and keeping it thus a few moments. Some years afterwards I was consulted by Mrs. G— —, who had often been affected in the same manner for many years. I mentioned my case to her, and advised her to try the same means. The plan answered for her, and by relieving the spasm at once, the tendency to its return was afterwards entirely prevented. Cramp in the leg from spasms of the gastrocnemii is instantly relieved by seizing the foot, and pressing its dorsum towards the front of the leg, thus bringing down the heel.

Whenever you meet with cases of this kind, remember those I have

placed before you and the observations I have made: follow the same practice, and you will often have the same satisfactory result. I could give you many more examples; but the few I have brought before you have been sufficient to explain the practice to be followed in such cases. My object in giving this lecture will be fully gained, if, when you meet with these cases, you recollect what has here been stated, and do not overlook them. Remember, your medicines, your embrocations, your frictions, fomentations, and warm baths. will be of little avail; but place the origin and insertion of the contracted muscles as far apart as possible. They will then become relaxed; maintain them in this relaxed condition for a length of time, and the tendency to contract will cease. In the mean time, the antagonist muscles will gain strength, the balance of power will be restored, and the natural action of both sets of muscles will be obtained.—*Lancet, September* 20, 1851, *p.* 265.

72.—ON HYSTERICAL AFFECTIONS OF THE HIP JOINT.

By William Coulson, Esq., Surgeon to St. Mary's Hospital, and to the Magdalen Hospital, &c.

[Mr. Coulson was consulted in the case of a young lady, nineteen years of age, highly nervous and excitable in temperament, with an affection of the hip joint. Leeches had been applied, the recumbent position enforced, and counter irritation in every available form employed—but all of no avail. The pain was diffused and complained of as insupportable. The joint under examination seemed natural, and her general health had not suffered in proportion to the duration of the disease; indeed, there seemed as much pain excited if the integuments alone were examined. No persuasion could prevail upon her to make use of the limb. Steel and quinine were prescribed, but with no success. At length, by the death of her father, the means of living became much reduced, and the different members of the family were obliged to exert themselves to meet the calamity.]

This young lady upon being made acquainted with the particulars—for misfortune it was none to her—one day suddenly rose from her couch and walked. She exerted herself much, both mentally and bodily, for the good of those around her, seemed to forget her long illness, and has ever since remained well. That the joint was not affected with any organic change is clear from the result of the case. The disease was one of those obscure hysterical affections, more common among the rich than the poor, during which the impression of pain is in a morbidly excited and perverted state, and the power of the will over a certain group of muscles is suspended.

A limb was removed by a surgeon from a patient, whose symptoms, in many respects, corresponded with those in the case I have above related. The girl was in humble life, but well brought up, and was much noticed by some ladies who superintended the school where she was educated. She was of pale complexion, with dark hair and eyes, and of highly excitable temperament. Without apparent cause, severe pain

came on in the right knee; the leg became flexed upon the thigh, and the slightest effort at extension excited impressions of intense suffering. She became an interesting object of pity; numerous professional opinions were asked by her patronesses, and frequent visits were paid to her by different surgeons. All, however, urged the necessity of her leaving her bed and using the limb; a measure to which she professed herself unequal. At the expiration of three years, during which her condition varied but slightly, a surgeon was induced, upon her representations, to recommend the amputation of the limb. To this she assented; the operation was performed, and the wound healed without any unfavourable symptom. Upon examination, the joint was found to be perfectly healthy. The synovial membrane retained its normal delicacy and transparency; the articular cartilage was slightly thinned, as is usually the case in a limb that has been long disused; the bones were light and easily sawn, but otherwise healthy; and there were no morbid changes in any of the surrounding structures.

It has been calculated, that at least four-fifths of the females among the higher classes of society supposed to be suffering from diseases of joints, are, in truth, affected with hysteria, and with nothing else. As, in the one case, absolute rest is requisite to effect a cure; and in the other, the patient must be urged, nay, even forced to take exercise, in spite of complaints of pain, it is important that the surgeon should be familiar with everything that will assist him to form an early and accurate diagnosis.

In hysterical affections of the hip joint, the patient from the first complains of pain in the part, and not in the knee, as is frequently the case when organic changes are commencing in the joint itself. The pain which the patient describes as most severe is not limited to one spot, but extends over the buttock to the lumbar region, and down the thigh. It is this general diffusion of pain which constitutes one of our most useful distinctions between this affection and disease of the hip joint. From the commencement, the patient complains of such aggravation of pain by pressure and motion, that she confines herself to one position of the limb; and yet upon occasions, when the mind is otherwise occupied, or during sleep, she will move it without complaint. The sensibility of the limb to the touch is frequently so great, that the slightest pressure on any part of the hip or thigh will cause the patient to scream; she shrinks involuntarily from the mere approach of the hand, but nevertheless, upon a careful examination, these morbid conditions will be found to exist more in the skin than in the deep-seated parts. As Sir Benjamin Brodie, who first directed attention to these important affections, observes: "If you pinch the skin, lifting it at the same time off the subjacent parts, the patient complains more than when you forcibly squeeze the head of the thigh bone into the socket of the acetabulum." The more the patient's attention is directed to the part, the more the pain is increased; but if her attention be directed otherwise, she will hardly complain, and the pain does not interfere with her rest. In disease involving the structures of the joint, there is nothing of which the patient complains so much as the inability to sleep at night. Just as "Nature's soft nurse" comes to soothe the suffering and exhausted frame, a sudden

start, or pain, or cramp, banishes sleep, and the patient dreads again to close her eyes. In hysterical affections, on the contrary, the sleep is calm and refreshing; and this, perhaps, is a great reason why the general health so slightly suffers, even in long-protracted cases. The pain is anomalous in its character, and different from the result of inflammation, or other organic changes. It may not be always easy to arrive at the truth, for such is the morbid constitution of the mind, that when leading questions have on a previous occasion been put, the patient will, as it were, take the hint, and symptoms, for which we previously may have in vain inquired into, will now actually present themselves.

A young lady, the subject of hysterical hip disease, came under my care, the case having previously been mistaken for disease of the joint, and moxæ applied. The knee was bent; the limb inverted; the thigh rested upon its fellow, and the head of the bone was preternaturally prominent. A superficial observer might have easily mistaken it for dislocation. The most positive assurance on my part could scarcely remove the impression which existed in the minds of the parents that there was no organic disease in the joint, and that there was no necessity to pursue the plan of counter-irritation and confinement. My patient was first directed to take out-door exercise in a carriage; with much trouble the limb was at length straightened; then she was persuaded to attempt to walk; and by these means she ultimately recovered.

Sir Charles Bell relates a case of this kind; and similar cases are not uncommon, in which "the knee was bent almost to the bursting of the ligaments, and the foot turned in so extraordinary a manner that the great toe lay close to the anus."

The age most liable to this affection is from fifteen to twenty; but when once developed, it may continue for a long period. I have met with cases in which the catamenia were irregular or scanty; but in other instances they have not deviated from health. The bowels are sometimes, but by no means invariably, constipated.

I will now sum up the symptoms by which this affection is distinguished from disease of the hip joint. In *the nervous affection*, pain is felt, from the commencement, in the hip, and extends to the loins and down the thigh; there is great general nervous excitability, and extreme sensitiveness in the part; and the patient is from the first unable to walk. Combined with this extreme amount of expressed suffering, the trochanter major retains its proper bearing to the spine of the ileum. There is not the characteristic wasting of the glutei muscles, and consequently no flattened appearance of the nates. Pressure in these situations, where the bone approaches almost the surface, does not excite greater pain than in the other parts. There are none of those involuntary startings during sleep, which cause the patient such intense agony. On the contrary, however loud may be the complaints of the painful condition of the limb while the patient is awake, no sooner is she asleep, than she rests well and calmly throughout the night. In *true hip disease*, the reverse is the case; for, when nature is exhausted by suffering, and the patient faint from want of rest, the sleep, if unaided by the administration of opium, is broken by sudden cramps, shooting pains, and frightful dreams, or vague anticipations of coming pain.

There is one circumstance attending this affection of the joint, which is calculated to mislead the inexperienced practitioner. I allude to its being often described as consecutive to a blow or other injury. In fact, many surgeons believe that there is generally some such cause, which determines the manifestation of these nervous phenomena in any one particular joint. I cannot say that I share largely in this view. Were local injuries alone the exciting cause, the pain would be equally felt in such constitutions, in whatever joint were the seat of the accident; whereas, it is well known that, in by far the greater number of cases, the neuralgia is in the hip or knee.

[Dr. Conolly remarks that, in the nervous system of hysterical patients, there is an original susceptibility in excess, and that the natural constitution of the nervous system, and even different portions of it, is different in different individuals. With regard to the pathology of these affections, we know little. Is it in the brain or spinal cord? Are the pain and muscular contractions dependent upon the morbidly excited state of the spinal cord, the brain responding to these impressions? Or is it that the functions of the brain are all perverted? Mr. Coulson inclines to the latter opinion; though, no doubt, in many instances, there are undoubted proofs of a highly sensitive and excited condition of the cord.]

With regard to the treatment of this affection, it is obvious that, if it be mistaken for organic disease of the hip joint, the surgeon will be led to adopt a line of practice, not merely useless, but positively injurious. The seat of the disease being in the nervous centre, little can be done locally, with any benefit or relief to the patient. We are, therefore, called upon to direct our remedies to the state of the nervous system generally. The patient must be persuaded to leave her couch as soon as possible. It is useless to wait until the painful sensations have subsided. She must take carriage exercise daily, be in the open air as much as possible, and in the society of lively and cheerful companions of her own age. The diet should be plain and nutritious. In the common forms of hysteria, I find the vegetable tonics more efficacious than the metallic; but, in that now under consideration, they possess no superiority. Their employment, however, is by no means to be laid aside; for in all cases where the tongue is foul, and there are other evident signs of derangement of the digestive organs, they are more beneficial than any preparations of the metals. But under different circumstances, as when the appetite is tolerably good, the tongue clean, and the bowels regular, then it is that the metallic tonics may be tried with great effect. In most neuralgic affections, the preparations of iron prove successful; and among these the carbonate stands justly preeminent. It may be prescribed in as large a dose as the stomach will bear without inconvenience. Among the medicines that directly soothe the pain, none are preferable to valerian; for though much less powerful than opium and belladonna, it neither constipates the bowels, nor enfeebles the system.

"The medicine which I have found the most useful," says Dr. Copland, "is the spirits of turpentine, prescribed in various modes, internally and externally, and administered in enemata; the preparations of iodine, alone, or with narcotics and camphor. These, however, should

be associated with suitable adjuvants; amongst which, the several narcotics and antispasmodics are the most important. The warm or vapour bath, simple or variously medicated; mental excitement, and exercise taken regularly and energetically, and employment of the mind, are also important aids in the treatment. The affections of the joints are sometimes accompanied, or even alternated, with severe nervous pains in the extremities, and occasionally with tenderness in some portion of the spine. In such cases the treatment hardly requires any material alteration. In those which have come under my care, I have very frequently prescribed the spirit of turpentine, as already stated, and often repeatedly in enemata; and after two or three doses of it, I have commenced with the preparations of iodine, conjoined with henbane, opium, or belladonna. Whilst the iodine has been given, the turpentine has been administered in enemata, from time to time; and embrocations or liniments assiduously employed."

When the pain has been extreme and almost insufferable, the local abstraction of blood by leeches has afforded relief; but it has been only temporary: and, as the effect of the loss of blood necessarily is to weaken the frame, their application cannot be often repeated without producing permanent mischief.

Counter-irritants, such as blisters, setons, stimulating liniments, mustard-poultices, and the like, all aggravate instead of relieving the pain. The belladonna or opium plaster, and sedative liniments, are the only local applications which I employ.

It may, however, be fairly questioned to what extent medical treatment in these cases is productive of good, unless there exists some evident derangement, against which our remedies may be directed. Far more is to be effected by moral treatment. Those absurd fancies to which young women of the present day are peculiarly susceptible, and which prevent their giving way to the vivacity and buoyancy of spirits suited to their age, should be carefully checked. The mind should be trained to regain its elasticity, instead of brooding over melancholy forebodings, or seeking to excite sympathy and compassion. The patient (cruel as it may seem) should not be allowed the privileges of a sick-room; nor should she be permitted to recline upon the sofa during the day, an interesting object of solicitude to her friends, and of care to a medical attendant. By being compelled to move the limb, and enter into society, patients have been known to recover, after the complaint had resisted every other kind of treatment.

The time of cure varies. Sometimes it is instantaneous; at other times it is slow. The time, however, does arrive, when this morbid state of the nervous system passes away, and the patient begins, though somewhat late in the day, to feel grateful to those to whose judgment and perseverance she owes her recovery. Above all, let it be remembered, that in this affection, the power of motion is present from the beginning; but the will to exercise it lies dormant, until called into action by some sudden emergency, or excited by moral and remedial means. — *London Journal of Medicine, July*, 1851, *p.* 630.

73.—CASE OF DISEASE OF THE ELBOW-JOINT.

By JOHN GAY, Esq., Surgeon to the Royal Free Hospital.

Amputation of the whole limb, excision of the articulating surfaces, and the bringing about of anchylosis, are the three modes which have been hitherto resorted to, not to cure diseased joints, but to prevent the constitution from sinking under the drain of a disease but too often found incurable, and to render the portion saved in some degree useful to the individual.

Amputation, sweeping a remedy as it is, unfortunately but too often proves like the others inadequate to save the life of the patient; in many cases it hurries him to his grave, and shows only too forcibly how powerless our ordinary remedies are. Were it even of itself capable of always effecting a safe and complete cure, the mutilation it inflicts would ever prove a great obstacle to its employment. Excision of the articulating surfaces, which has saved many a limb that would otherwise have been amputated, has proved fatal in some cases, has succeeded but indifferently in others, and is tedious not only as regards the operation, but also the after treatment.

It is almost needless to say, that in a vast many instances all ordinary means of curing these diseases fail. Rest, splints, bandages, tonics, change of air and diet, mercurials, iodine, all fail to stay the progress of the disease, until it no longer becomes a question as to whether we shall have recourse to the knife or not, but how soon, and in what way, it is most advisable.

Mr. Gay has for some time past been in the habit of treating cases of diseased joints by a plan which has so far been found to be at one and the same time simple, rapid, and effectual. It is nothing more or less than to make one or more incisions right down to the diseased joint with a view of letting out the debris of the diseased articulation, the remnants of the cartilages, &c., which seem to him one of the principal obstacles to the procuring of anchylosis; a healthy inflammation is by these means set up in the cavity, which speedily results in firm and complete anchylosis. The constant success which has attended this plan seems calculated to bring about a complete revolution in the treatment of these complaints, and we hasten to lay before our readers details so full of interest.

J. T., a labourer, entered the Royal Free Hospital, under Mr. Gay, August 28th, 1851, with disease of the elbow joint. Of its origin and cause he knew nothing, and only remembers that it began about seven years ago, and since then it has run its course unchecked by any means. On admission, the state of the limb was as follows:—the arm was straightened and the elbow joint almost immoveable, even the slightest attempt to procure motion being followed by excessive pain. The joint itself was very much enlarged, but the remaining part of the limb was wasted to a considerable extent. There were six sinuses leading to the joint, two on either side, one in front, and another on the inner side of the olecranon. Around their orifices the skin was livid and unhealthy-looking, and they all conducted direct to the joint, so that the probe passed immediately into it. A quantity of thin, ichorous fluid was constantly poured out from them. The man's health was much impaired, and although he had

refused his assent to amputation, which had been proposed to him while an inmate of another hospital, he was now willing to lose his limb, or, indeed, undergo any operation which seemed likely to free him from his constant sufferings.

On the 1st of July, although the state of the joint seemed to hold out scarcely the remotest hope of success, Mr. Gay made an incision on either side, carrying it along the course of the lateral sinuses, and fairly down to the joint. These incisions were each four inches long, and left behind great gaping wounds, laying open to view the interior of the joint. The ends of the bones were found completely bereft of cartilage, and so soft that portions were as readily torn away by means of a steel director as if they had been so much cork. But little bleeding followed the operation, which was concluded by filling up the cavities with lint, and confining the joint with a bandage. The first thing that ensued was a most profuse discharge, which continued unabated until about nine days after, when it gradually began to lessen, owing to the evident healing of the wounds, which now appeared strongly disposed to closeness. By the 29th, considerable progress had been made, but now the patient was, most unfortunately for himself, seized with simple fever. The wound rapidly assumed an unhealthy appearance; the joint was attacked with acute pains, and great quantities of thin dirty pus were poured out in place of the previous small amount of healthy secretion. The tongue grew furred, the skin dry and hot, whilst the pulse sank and quickened. His sufferings became very great, and in the course of twenty-four hours the sores had so increased, both in depth and extent, that the joint was almost laid bare. At this stage the patient most urgently entreated the removal of the arm, and Mr. Gay had almost decided, seeing the unfavourable turn matters were taking, on doing so as soon as the man's health should be somewhat recruited. But better things were in store for him. Active and judicious general treatment was resorted to; the patient's strength was carefully kept up by good diet, and the greatest attention. The secretions were vigorously watched over, and every effort strained to prevent him from sinking. On the fifth day a grain of opium with mercury and chalk was ordered three times a day, as there were no symptoms of local congestion; this relieved him greatly.

The joint was now constantly enveloped in poultices. On the ninth day the fever had left him, but in a very weakened state, and the wound began again to discharge healthy pus, and to show a tendency to granulate. He was ordered tonics, and an improved diet.

From this time the progress of the case was much more favourable and rapid than any one could have anticipated. The wounds began to close, and the discharge perceptibly lessened. Complete closure of the edges of the wounds was, however, studiously prevented by inserting pledgets of lint between them, and the joint was now as firmly bandaged as the patient could bear. By the 12th of September the wounds had completely closed, and anchylosis of the joint had taken place. An abscess, however, formed beneath the skin on the outer side of the joint; it was opened, and soon healed firmly up. Anchylosis took place, evidently enough at first by means of a soft, perhaps fibrous tissue, and hence some degree of motion was retained in the joint; latterly, however, this has

ceased, and the uniting medium has apparently become ossified; at least its hardness and immobility would lead to such a conclusion.—*Med. Gazette, October* 3, 1851, *p.* 598.

74.—ON THE VAGINAL, OR DEEP BURSÆ MUCOSÆ.

By William Coulson, Esq., Surgeon to St. Mary's Hospital, &c.

[Mr. Coulson explains his meaning of the term "deep bursæ mucosæ" to be the synovial membranes, usually vaginiform, interposed between two or more tendons, between tendon and bone, or between tendon and ligament, for the purpose of protection from the effects of friction, and for facilitating motion.]

In the upper extremity, where we have chiefly to deal with morbid conditions of these bursæ, the synovial membrane extends downwards as far as the distal insertion of the tendons, and upwards for some distance beyond the fibrous sheath. Each tendon is covered by a reflexion of this vascular membrane, and is loosely attached in the whole, or in part, of its course, to the walls of the canal, by a fold similar to the mesentery, and called meso-tendon. These folds limit the movements of the tendons in a slight degree: they may be torn by some violent movement, and are occasionally the seat of disease.

Anatomical Arrangement.—Upon the dorsal surface of the wrist, there are distinct sheaths,—1. For the extensor carpi ulnaris; 2. For the extensor minimi digiti; 3. For the extensor communis digitorum and the indicator; 4. For the extensor secundi internodii pollicis; 5. For the two radial extensors; and, 6. For the extensores ossis metacarpi et primi internodii pollicis. Any one or more of these sheaths may become distended, and assume the character of a bursal swelling. There are also five or six thecal sheaths on the palmar surface, and these are the most frequent seat of enlargement. Enlargement of the bursæ in this situation is a most formidable disease.

The sheaths of the extensor ossis metacarpi, and of the extensor primi internodii pollicis, and of the extensor carpi radialis longior and brevior, merit special anatomical notice, as they are often affected with morbid changes. The two first, free in their fibrous sheaths, but covered by the same visceral layer of synovial membrane, can only be partially separated; and there are some anatomists who regard the two tendons as divisions of one and the same muscle. The two extensors of the radial side of the wrist are likewise retained in apposition by a common visceral layer of membrane, as far down as their point of separation to their respective insertions. The synovial membrane there leaves the extensor carpi radialis brevior, being continued only over the extensor longior. Throughout their whole course a meso-tendon attaches them to the posterior wall of the sheath.

Along the anterior or palmar surface of the wrist, and forearm, we have two sets of bursæ; some small, and often overlooked, others of considerable size. The palmaris longus and brevis are each enveloped in loose areolar tissue, abounding in thick serous secretion; and it is

easy to comprehend how such a structure would become converted into a complete synovial sac under favourable circumstances. About three months ago, I removed from the hand of a working-man a thick walled cyst, lying between the integument and the palmar fascia, and containing a sort of synovia. It had doubtless been originally a bursa, thickened by the constant pressure of the hand upon the hard iron handle of an immense hammer. The patient described it as originally a small elastic swelling, situated under a part of the hand where the skin had for a long time been very much thickened; as the tumour increased in size, it pained the hand, and, interfering then with his work, made him anxious for its removal.

The tendon of the flexor carpi ulnaris has a large and well-marked synovial sheath, especially loose and sac-like, near its insertion in the pisiform bone.

Finally, there are the general synovial bursæ, which invest the tendons of the flexor muscles of the fingers, and of which many different anatomical descriptions have been given. Fourcroy and Bichat affirm, that there is one synovial bursa at the level of the carpus. Velpeau and Cruveilhier describe two, one common to the flexor tendons of the fingers; the other proper to the long flexor of the thumb. Monro, Koch, and Bourgery, enumerate a much greater number of bursæ in the anterior region of the wrist.

Some of the deep bursæ communicate directly with the joints. The bursa beneath the crureus muscle belongs to this order, likewise the large bursa below the iliacus and psoas; its frequent communication with the hip-joint is well known. On the other hand, there are some which greatly resemble the cellular bursæ in various stages of transformation towards the perfectly developed bursæ. Of this kind is the extended bursal arrangement around the tendon of the plantaris muscle; another, equally remarkable, is between the middle tendon of the omohyoideus and the sterno-mastoid; and a third interposes between the long abductor and extensors of the thumb on the one hand, and the radial extensors on the other.

These structures resemble in many respects the serous membranes, and are yet more closely allied to the synovial, with which, as I have said, they are not uncommonly continuous. Upon their free surface we find a stratum of epithelium, supported by a basement membrane, and under this is a layer of blood-vessels, which may be filled with injection in a part rendered soft by partial decomposition. The blood-vessels form a net-work many layers thick. No one would suspect the existence of such a number of arterial and venous capillary tubes, from the examination of this structure in its normal condition after death. In many situations are found vascular fringes, first noticed by Havers in the joints, and described by him as the source of secretion of the synovia. They are found along the thecæ of tendons, and in some of the bursæ in the neighbourhood of the knee, and are composed of loops of vessels. Although we may not be able to prove experimentally what tissue secretes, and what absorbs the oily fluid contained in these sacs, yet we may infer, that both processes go on most actively wherever the blood-vessels are most numerous. The vascular part of the bursa seems to

cease where the membrane is firmly attached to a bone, as along the phalanges of the fingers.

Symptoms and Pathology of Enlarged Vaginal Bursæ.—In using the terms *superficial* and *deep*, I allude, of course, to the primary connexions of these structures, and in no way to the situations which they may subsequently acquire. A collection of fluid, either in the large theca of the flexor tendons of the forearm, or in a sac connected with this membrane, may make its way towards the surface so as to elevate the skin like the pointing of an abscess, and to render it thin and discoloured; and yet we must include this under the head of deep bursæ. The same remark may be applied to the bursa in the neighbourhood of the knee-joint, connected with the tendon of the semimembranosus muscle, which frequently becomes enlarged and projects into the popliteal space.

The clear albuminous fluid, secreted in the healthy state by these structures, undergoes various modifications by inflammatory action. At first it becomes thinner and more sparing than natural, and the part, when examined, communicates to the fingers a crackling sensation. Then it may be more abundant, and cause distension of the sac, attended by severe pain. If this affection be deeply seated, and beyond the reach of surgery, it gives rise to very considerable suffering, and excites symptoms which are not readily understood. If, for example, it occur in the bursa of the tendon of the psoas and iliacus muscles, it may readily be mistaken for incipient disease of the hip-joint. In course of time, the fluid of an inflamed bursal sac entirely loses its oily nature, becomes serous and watery, and is frequently of a yellow, or even reddish-brown hue, from admixture of blood.

But there are sometimes found, especially in the synovial theca of the flexor tendons of the wrist, numerous hard fibro-cartilaginous bodies, like millet seeds, floating loose in the distended sac. They have been improperly called hydatids, but are, in truth, growths from the vascular fringe of the membrane, projecting inwards towards the cavity, and covered by epithelium. As they increase in size, the pedicle connecting them with the membrane, is eventually broken by the friction of the parts contained within. We have instances of similar bodies becoming loose in the cavity of a synovial sac, in certain rheumatic affections of joints. The enlarged bursa is not uncommonly loculated, or divided into partitions by septa or bands. In general, however, the compartments readily communicate one with another.

The most frequent seat of enlargement is the synovial sheath, which invests the flexor muscles of the fingers, and extends from the forearm under the annular ligament to the palm of the hand. When distended by fluid, it produces a considerable elevation, which is often constricted and divided into two parts by the annular ligament of the wrist. The walls, when laid open, are found to be thicker than natural; the lining membrane is rough; the fluid contained within is opaque, yellow, or yellowish-brown, and thick, and it frequently contains those small bodies above-mentioned, which are smooth externally, and often hollow; some, however, are solid, of fibro-cartilaginous structure, and resemble grains of rice in general appearance. The cyst, when minutely examined, is generally found thickened and of fibrous structure; externally it is con-

nected to the parts around by loose areolar tissue. Internally it presents a velvety or roughened appearance, and there proceed from it numerous fringes, of which some are pedunculated. Embedded in these fringes are sometimes those hard white bodies, which are frequently found free in the sac; some of them are elongated and seed-shaped, others flattened and triangular, or round. The smaller are generally solid; the larger contain a cavity. These bodies were described by Dupuytren as hydatids; and the term "hydatiform" has been applied to the bursal swellings about the wrist, under the idea that such parasites were the cause of the enlargement of the sac, and of the collection of fluid. Deviations, both in the quantity and in the consistence of the synovial secretion, may produce a peculiar condition of these fibro-serous canals, which yield upon pressure a crepitating or crackling sensation. This sound may be heard in whatever region of the body fibro-serous grooves naturally exist. It is commonly heard in the region of the shoulder-joint, where it is connected with a morbid condition of the sheath of the long tendon of the biceps flexor cubiti. M. Poultain relates a case, in which these symptoms gave rise to the notion of fracture; and in 'The Lancet' for 1836, 1837, the late Mr. Wallace, of Dublin, mentions a case, where an affection of this kind, in the extensor tendons of the thumb of a young woman, had been mistaken for fracture. The same sound has been heard about the tendons of the hamstring, and behind the internal malleolus in the sheaths of the flexor muscles of the foot; behind the external malleolus, along the course of the tendons of the peronei muscles and those upon the instep, and in other parts.

Although violence is often assigned as the cause of this affection, its its origin, in the greater number of cases, is obscure. It is more likely to depend upon the influence of some constantly acting source of irritation than on any sudden injury, and the symptoms which usher it in support this view. At times, indeed, there is at the commencement acute pain, which, however, gradually subsides when the part is at rest, and is excited only upon movement. But more commonly there is little or no pain felt by the patient, until he makes a greater effort than usual, when the attention is for the first time directed to the part. Upon awaking in the morning, the part is stiff, but the stiffness goes off after a little exercise. There is rarely either heat or redness; the latter is generally secondary, and referable to accidental rubbing and friction. There is always some amount of swelling, the form of which depends upon the natural connexions of the part affected. If the disease occur in the sheath of the extensores ossis metacarpi and primi internodii pollicis, the tumour extends obliquely across the lower part of the forearm, from the ulnar to the radial side. If it affects the radial extensors, the swelling, wider below than above, passes over the inferior and outer part of the broad extremity of the radius. Any anatomist can tell in what groove this affection is situated, by making the patient move under his direction the different muscles of the forearm. In severe cases, the stiffness of the limb, the sensation of weakness, and the pain upon movement, are so considerable, that a man is unable to follow his employment; and, in the higher ranks

of society, accomplishments, such as instrumental music, which require great freedom of movement, have to be suspended, or, indeed, entirely given up.

The manner in which these tumours shew themselves, is as obscure as their etiology. Sometimes a peculiar creeping sensation is experienced down the fingers, wrist, and forearm; at other times there is stiffness, weakness, and difficulty of movement. In other cases, it is the tumour which first attracts the patient's attention; and the symptoms above related are felt only at intervals, and after any greater exertion than usual. The shape of the swelling, as it affects the large bursa mucosa surrounding the flexor tendons of the fingers, is variable; sometimes it commences in the palm of the hand, at other times in the lower part of the forearm; and in both instances it soon becomes bound down by the annular ligament. Indolent, and painless upon pressure; fluctuating, and presenting irregular projections, it appears as a bilobed mass, upon which the fingers have an involuntary tendency to close. If the contents be steadily and forcibly squeezed downwards towards the hand, a movement may be communicated to the fingers, along whose thecæ the fluid is pushed. And during this examination, when the fluid is pressed backwards and forwards from one end to the other of the enlarged sac, a peculiar *frottement* is felt, upon which Dupuytren laid great stress as a diagnostic symptom.

The pain and sensation of weakness produced by such a tumour is so great, that the limb soon becomes useless; the fingers are permanently bent, and any attempt to extend them excites a dragging sensation along the entire cyst.

Cases occur, when the tumour is large, in which the ulnar artery and the superficial palmar arch are raised upon the swelling; the radial artery, too, may be separated from the bone, before it turns under the styloid process of the radius. The integument of the palm of the hand becomes thin from want of use, looses its transverse markings and lines; it is elevated into a soft, smooth, compressible swelling, extending, in severer cases, along the flexor surface of the fingers. Continued position of the fingers in this abnormal state, leads to permanent changes in their articulating surfaces, and in the ligaments which unite the bones one to another; hence it arises that in old cases, where the flexion has existed for a considerable time, the evacuation of the cyst, or the cure of the bursal enlargement, does not restore the mobility of the fingers.

Diagnosis of these tumours is not at all times so easy as many surgeons have affirmed. If situated on the palmar surface of the wrist, the bursa is recognised as a fluctuating bilobed mass, the shape depending upon the size of the sac, and the constriction of the annular ligament. But the contents may be of such consistence, that there will be no fluctuation. But the crepitation to which I have before alluded, produced by the passage of the fluid containing the hard grain-like bodies from one compartment to another of a sac, through a narrow orifice, may be taken as characteristic of the nature of the tumour, in connexion with the constriction produced by the annular ligament.

M. Robert, however, has recorded the following case of fatty tumour of the hand, resembling, in many of its physical signs, the affection which we are now describing. 'Annales de Therapeutique, tome ii.'

A young man, aged 27, a butcher, was admitted into the hospital, with a tumour of the size of half an orange, situated upon the ulnar side of the palm of the right hand. It was subcutaneous, soft, and elastic, giving a peculiar crackling sensation upon pressure, and lying in front of the flexor tendons: it was trilobed, and deeply grooved. The fingers were slightly flexed upon it. The patient had noticed it first when about twelve years of age. It remained stationary till three years ago, when it suddenly increased in size. After an exploratory puncture, a crucial incision was made, and the skin was reflected back, when a tumour was exposed, composed of two portions set one within the other; the inferior flat, but deeply hollowed in the middle; the other portion of a cylindrical form, lodged in the hollow of the preceding. The second portion was moveable upon the first; and the friction thus produced, communicated to the hand the "crepitating sensation" above referred to.

An important part of diagnosis rendered more valuable by accurate modern research, is derived from the consideration of the natural connexions of the bursal sac affected by disease. The origin of the tumour, its inclination rather towards the ulnar than the radial side, the effect produced upon the fingers, the free movements of the thumb,—these are points which indicate that the disease originates in the bursa of the general flexor tendons. The circumscribed swelling of the radial side of the hand, the weak condition of the thumb, the inability on the part of the patient to bring it into firm apposition with the rest of the hand, pronounce the bursal affections to be limited to the tendon of the flexor longus pollicis.

Prognosis.—Many years may elapse before these tumours acquire any great magnitude. Slow in their growth; often painless; obscure in their origin; they pass unheeded, especially among those whose occupations require neither the exercise of great strength, nor the application of great delicacy of touch. Ultimately, after years of enlargement, they become stationary, but they do not disappear; at least, there is no satisfactory case of the kind upon record. All, then, that we can expect nature to effect, after the establishment of the disease, is the arrest of the further enlargement of the tumour.

As regards the serious nature of these affections, those tumours confined to a single finger, often limited in extent, are less to be feared than those in the palm of the hand, involving the entire bursa, and requiring the performance of an operation, which, though simple as regards execution, may be followed by dangerous symptoms.

Treatment.—It is customary, in the chronic cases, to employ counter-irritants, such as blisters, irritating ointments, &c. The emplastrum ammoniaci cum hydrargyro, spread upon leather, may be applied to the limb, and secured by a firm bandage; the whole to be worn for several weeks. If the fingers are stiff, friction of the limb and passive motion may be resorted to, when the swelling has in great measure disappeared, and the fluid is nearly absorbed. The arm may be soaked and rubbed

in a warm arm-bath daily. When the limb is immersed in a heated fluid, much greater force may be used with impunity, than under the ordinary circumstances.

The operations which have been recommended for the cure of these synovial tumours are the following:—Extirpation; incision, either simple or combined with irritation of the surface of the cyst; subcutaneous puncture; and iodine injections.

As regards extirpation, it is extremely difficult, on account of the extent of the connexions of the sac.

I have generally contented myself with making an incision longitudinally through the most prominent part of the swelling, and evacuating the contents. Some amount of inflammation usually supervenes; and the cavity becomes obliterated in the usual manner. But there is a risk of the inflammation proving very severe, and extending along the muscles of the forearm, attended with a high degree of fever and constitutional disturbance. Death has ensued from such an attack; and in other cases, in which the inflammation has been subdued by active treatment, the mobility of the fingers have been permanently impaired.

The use of the seton may lead to results difficult of management, and even dangerous to life. The following case, recorded in the 'Leçons Orales' of Dupuytren, shows how a fatal result may follow its employment.

Case. A carpenter, aged 35, received (Dec. 1812) a sprain in the right wrist, which healed in a short time without trouble. About two or three months afterwards, he remarked a small tumour in the palm of the hand below the annular ligament, and soon afterwards a second above the ligament: they were at first very small, and but little troublesome. They impeded at first the free exercise of the hand, and afterwards prevented its motion altogether. Being unable to continue at his trade, he consulted M. Dupuytren, June 7th, 1814. From its position, the nature of the tumour was suspected; and examination rendered the point clear. The following day, an incision was made into both tumours, and a multitude of little white bodies immediately escaped. The aponeuroses of the hand and of the forearm were liberated by means of a blunt-pointed bistoury, that there might be no constriction in the event of inflammation. A seton was introduced to inflame the walls of the cyst; and a poultice was then applied to moderate any inflammation that might arise. Severe pain supervened on the evening of the operation. It increased, accompanied with great swelling, on the second, third, and fourth days; a greyish fluid, mixed with flakes of lymph, flowed from the wound. The seton was removed the fifth day. The inflammation extended to the arm, and to the axilla; and constitutional symptoms of the most distressing kind arose on the eighth day; some gangrenous aponeurotic structures were divided. An abscess, which had formed between the first and second metacarpal bones, was opened. Compression expelled a quantity of pus, which had formed sinuses the whole length of the forearm and hand. On the tenth and eleventh days, there were shiverings, with convulsive action of the jaws, lasting about ten minutes. The pus was extremely fetid. There was general weakness, which resisted the most powerful tonics; and death ensued on the fifteenth day from the operation.

This case made a great impression upon Dupuytren, who for the future changed his mode of operation. In place of a simple opening in the most prominent part of the tumour, he made large incisions; and substituted for the seton a piece of lint interposed between the edges of the wound, to prevent their union. Mr. Syme, of Edinburgh, impressed with the same fear of constriction in these cases, has recommended the preliminary division of the annular ligament, as was suggested a long time ago by Warner. Mr. Syme has published a successful case in the 'Edinburgh Monthly Journal' for October, 1844.

Professor Gerdy has successfully practised the subcutaneous incision; and such an operation has much to recommend it, as there is not that fear of the severe inflammation which often attends the exposure of the cyst. The operation should be combined with pressure; still, though less dangerous, it is also less sure than incision, and there are many cases in which it is impracticable.

Iodine injections have been recommended by Velpeau in the treatment of these bursal enlargements, but many objections have been raised against the practice, on account of the chance of severe inflammatory disturbance. I am inclined, however, to recommend this plan for adoption.

M. Chassaignac has related a case in the 'Gazette des Hôpitaux, in which, after having evacuated the fluid, he injected through a canula, first some warm water to clean out the cyst, and next some tincture of iodine. The cyst was then emptied, moderate pressure upon the walls was exerted by means of a compress, and the opening made by the trocar was properly secured. Some inflammation supervened; but it yielded to treatment, and the case terminated favourably.

An analysis of the cases in which this treatment has been tried is decidedly favourable to the practice, although I am not quite prepared to agree with Michon, that there is less chance of inflammation than of relapse and the re-collection of the fluid. An attack of inflammation of the hand is always a serious matter, often so impairing its movements, as no subsequent endeavours on the part either of the patient or of the surgeon may be able to rectify.

Professor Bouley has demonstrated the superiority of iodine injections over other means of exciting inflammation, and he has succeeded thus in dispersing tumours of large size, without danger or inconvenience. If therefore simple puncture or incision should fail in the first instance, I recommend this practice as far preferable to the introduction of setons and other foreign bodies.

It must not be supposed that the surgeon has effected all his task by the evacuation of the fluid and the obliteration of the cyst. There remains for him to restore the mobility of the fingers, long since become stiff, semi-flexed, and in great part useless. For this purpose he must recommend exercise, passive motion, baths, &c., and by perseverance the hand may again be brought into a useful state.

It is singular that this affection of the bursa of the flexor muscles of the forearm and hand should be rare in the corresponding structure in the lower extremity, more especially considering how the foot is compressed in tight boots, and exposed to constant violence and injury. A

case, however, of the kind is related in the 'Medical Times' July 13, 1850. A young lady, aged 20, of slight frame, but in the enjoyment of very good health, consulted Mr. Stanley for a painful swelling of the right foot and ankle. Five years previously, she had been greatly fatigued by a walk of extreme length, and she arrived home much exhausted, but was sufficiently recovered in a few days to go about as usual. From that time, however, the right foot and ankle were weak and painful, and swelled upon her taking the least exertion. About two years ago the swelling became permanent, and the ankle, which was easy when at rest, was so painful when she attempted to walk, that she was obliged permanently to keep the horizontal posture. Every variety of treatment had been adopted without avail; the swelling about the joint increased until the integuments gave way, and there formed an ulcer, whence flowed a thin sero-purulent fluid. There was a large swelling between the tendo Achillis and the os calcis, extending down to the sole of the foot; part of the swelling was firm, part was elastic, as if containing fluid; the integuments covering it were thinned and livid, and had given way in one spot, exposing a fungous-looking mass of granulations; the movement in the joint was perfect. The limb was removed, and the morbid change was found to be limited to the synovial thecæ, which surround and accompany the tendons of the tibialis posticus, and the flexor communus digitorum muscles to the sole of the foot. It was, therefore, strictly circumscribed and surrounded by healthy structures. The thecæ were thickened: their usual bright synovial surface was converted into a dull, uneven velvety structure, from which was produced a soft growth composed of cytoblasts, and a small quantity of delicate fibrous tissue. This growth made its way upwards between the posterior surface of the tibia and the tendo Achillis, and downwards into the sole of the foot, between the flexor brevis digitorum and the flexor accessorius muscles, both of which were quite healthy. The flexor tendons were unaltered in structure, but were surrounded by the soft growths above described, and by a large quantity of morbid synovial secretion, which seemed to be contained in more cavities than one; for behind the malleoli it was of pale straw colour, and somewhat stringy, whilst in the sole of the foot it was of watery consistence, of red colour, from admixture of blood, and contained coagula.

I cannot conclude this paper without strongly recommending those who desire further information on the subject to consult the thesis of M. Michon, to which I am indebted for many of the preceding details.—*London Journal of Medicine, Oct.* 1851, *p.* 881.

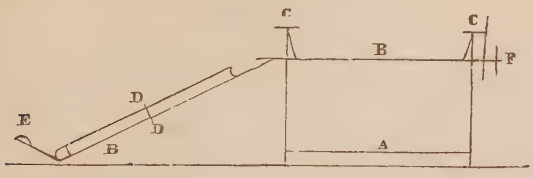
75.—THE SLING FRACTURE-BED.

By T. M. Greenhow, Esq., Senior Surgeon to the Newcastle-on-Tyne Infirmary.

[Mr. Greenhow draws attention to his new invention on account of the advantages he believes it to afford in the treatment of fractures of the femur, especially in the upper third, and in compound fractures of the

leg, wherein it secures reduction and maintains a permanent position of ease, undisturbed by the most elaborate dressing. He says,]

A careful inspection of the instrument will render its application easily understood, but the slight diagram I enclose may serve to illustrate its leading features.



The stand A rests upon the bed; the splint B is supported by slings from four uprights at C C, and may be raised or lowered at pleasure by the screws at top. The thigh-splint rests on the bed at the ischium, and both behind and at the side can be lengthened or shortened to suit the length of the femur, by acting on screws at D D. A groin and a waist belt, passed through the strong loop E, fix the pelvis to the splint, giving ease and security to the patient, who is enabled, within certain limits, to move the pelvis, so as to relieve the irksomeness of an unvarying position, and for other necessary purposes. The extension of the leg is effected by acting on the screw at F, by which the foot-piece is drawn down gradually, but powerfully, and with the greatest degree of precision. The calf of the leg rests upon a moveable piece of India-rubber cloth, or cross strips of bandage, capable of being most easily removed and replaced, when dressing and cleansing are required; and the outside thigh-splint and loop E can easily be adjusted for either limb. Of course the injured extremity requires to be protected by pillows suitably arranged on the fracture-bed.—*Lancet, September* 20, 1851, *p.* 276.

76.—*On a New Apparatus for Fractured Clavicle.*—By Henry Lee, Esq., Assistant Surgeon to King's College Hospital, and Surgeon to the Lock Hospital.—[When the clavicle is broken, the shoulder falls in by the action of gravitation, being drawn by the action of the muscles into contact with the ribs. To remedy this, the most common method employed is the figure of 8 bandage applied across the shoulders. This keeps the two scapulæ on the back of the chest, and prevents their anterior edges from falling forwards. The next is that of M. Desault, consisting of a wedge-shaped cushion placed on the axilla with the thick part upwards. A third plan is the recent one of Mr. Ellis's, consisting in the adaptation of a firm cushion in the shape of the top of a crutch to the axilla of the affected side. But in this, as in the method of M.

Desault, the cushion which forms the fulcrum is constantly liable to move with the motions of the ribs. Mr. Lee says:]

Messrs. Philp and Whicker, of 67, St. James' Street, have, at my request, constructed an apparatus, by means of which lateral extension can be mad in cases of fractured clavicle from a fixed point. It consists of a backboard, retained in its position by two broad straps crossing over the shoulders, and by a perpendicular plate reaching to the loins, and connected with a band round the waist; a firm cushion is adapted to each axilla, and extends to the front of the shoulder-joint. To the anterior extremities of these, the straps which go over the shoulders are buckled. Each cushion is directly connected with the backboard by means of a steel bar, slightly concave forward, and capable of being extended laterally and fixed in position by means of a screw. When applied, the two cushions are separated to a convenient distance and fitted to the axillæ. The straps are drawn moderately tight over the shoulders, and the elbow of the affected side is connected with the body by means of a handkerchief or bandage. It is advisable also to support the arm in a sling; and this may be conveniently done by passing a broad band from the elbow in front and behind the arm to the opposite shoulder, below which the cushion in the axilla affords a fixed point for its attachment.

The principal advantage of this apparatus consists in its different parts being so connected and adjusted as not to move with the motion of the ribs; for as these are raised, in all their ordinary actions, simultaneously on both sides, any influence which they possess must be exercised equally in different directions; and as corresponding parts of the apparatus are placed upon the two sides of the chest, any tendency to displacement is exactly met and counteracted by a similar tendency from the opposite side. The result is, that although the cushions rest upon the ribs, they yet do not move with the ribs, but afford firm, and comparatively fixed points of support.

A second advantage of this apparatus consists in its not requiring to be readjusted; should the bandage round the body, or the sling which supports the arm become loose, they may be tightened without in any way disturbing the position of the instrument, or the fracture.

A third point of some importance is, that the arm on the opposite side to the fracture is not confined, and the patient may, in ordinary cases, be allowed to walk about as soon as the instrument is properly adjusted.

In severe fractures of the clavicle, and in such as are complicated with injury to the ribs, it may become desirable to remove all pressure from the side of the chest. This may readily be accomplished by increasing the distance between the two cushions, and connecting *both* the arms with the body. Any amount of lateral extension may in this way be made without any pressure upon the ribs, and even without interfering in any degree with their actions.—*London Journal of Medicine, September* 1851, *p.* 799.

AMPUTATIONS.

77.—SOME OBSERVATIONS ON EXCISION OF THE PELVIC EXTREMITY OF THE FEMUR.

By Dr. R. Knox, F.R.S.E., Lecturer on Anatomy, &c.

[Dr. Knox makes the following observations as the results of a long professional life. As two of the most distinguished surgeons are antagonistic in their views on this subject, Dr. Knox states his obligation to Mr. Walton, who has published a list of all the operations which have been performed up to the present day. According to some surgeons, excision of the head of the femur is an operation quite unjustifiable under nearly all circumstances. That an extreme opinion condemnatory of the operation in all or even in most cases is wholly erroneous, or, at least, a hasty and ill-founded opinion, based on no extensive pathological research, may be proved by the following cases collected by Mr. Walton.]

Case 1.—Eliza Wingen, aged 10. There had existed morbus coxarius, terminating in dislocation of the head of the femur. Excision of the head and neck of the femur was practised by Mr. Fergusson. The head of the femur was found to be much reduced in size, and was carious. Scarcely a trace remained of the acetabulum; it seemed to have been filled up with new bone. The patient recovered. (See 'Medical Times,' April 7, 1849.)

I abstain from making any remarks on the details of this case, it being put forward here merely to show the untenable character of the extreme opinions advanced by a portion of the medical press in respect of such an operation as the one I have just quoted.

It has been stated by an excellent surgeon (Mr. Lloyd), and his opinion has been echoed by others, that the surgeon ought to wait and delay operating in cases of hip disease until the constitutional disease has ceased. Now, what proof is there in the history of the above case that the constitutional disease had ceased? Is it usual for scrofula to desist from its ravages at ten years of age? and if, by an unusual combination of fortunate circumstances, the constitutional affection had really ceased in the case of Eliza Wingen, by what symptom was it known to have done so? Is it usual for surgeons to wait for the cessation of the scrofulous diathesis in white swelling of the knee-joint, or in any other disease, when death is imminent, before they consent to operate?

In respect of the condition of the acetabulum in the above case, the question is too important to be discussed in a cursory manner, when merely alluding to it as a successful case after operation. There is no proof that the acetabulum had ever been diseased; and I question the supposed deposition of bone presumed to have filled up the cavity. In very young persons—and the patient was only ten years of age—it is just possible that pelvic disease existed and had ceased prior to the operation, and that the cotyloid cavity had been filled up by a deposition of new bone. But this view of the case I am not disposed to take. It is far more probable that no pelvic caries had ever existed, or, if so, only

to a small extent; and that the seeming filling up of the cotyloid cavity was due to a very different process. In the adult, whether in man or animals, after unreduced dislocation of the femur, the cotyloid cavity disappears, not by a process of filling up, but by absorption and consequent levelling of the elevated borders of that cavity. The joint being no longer used—no longer required, in fact, the acetabulum being no longer filled by its appropriate bone, the articular apparatus disappears; the synovial membrane and arthroidal cartilages break up by disintegration; the fibro-cartilaginous rim or border equally gives way, and the deep margins of the acetabulum become absorbed. It is this levelling process which makes the cavity look as if it had been filled up by new bone. The same happens to the glenoid cavity of the scapula in unreduced dislocations of the shoulder; and the total disappearance of the alveolar cavity by absorption and not by filling up, when a tooth has been extracted, is a strictly analogous process. Admitting, then, the possibility of a filling up of an articular cavity by new bone under such circumstances, in very young persons, such occurrences in the adult must be exceedingly rare.

That pelvic caries must be a frequent concomitant of caries in the femur, the pathology of scrofulous disease warrants us to assume. It constitutes, in fact, the main difficulty in all such cases. Nevertheless, it must be kept in mind, that the femur is a moveable bone, and the pelvis is a fixed one,—an important consideration in respect of an operation by which it is proposed to remove the moveable bone or fragment, leaving the fixed one to its chance of recovery when no longer exposed to contact with the diseased moveable one. It gives the pelvic bone an additional chance of recovery. At all events, matters cannot be worse than before the operation.

On the other hand, it does sometimes appear, that at a certain stage of the morbus coxarius, when dislocation has taken place, that is, when the opposing diseased surfaces are no longer in contact, the pelvic portion seems to recover. But, be this as it may, it is certain that in the caries of adults, when attacking these bones, the head of the femur may be the sole part affected; or the caries may be confined exclusively, as I shall afterwards show, to the upper surface of the great trochanter, and may easily be covered with the point of the finger. Now, as adult caries is quite incurable by any means short of the actual cautery or excision, it is not surely meant by any one to leave such cases to themselves.

During the last twenty-five, or it may be thirty years, the attention of surgeons has been directed to the propriety of extracting, through an external excision made for this purpose, so much of the head and neck of the femur as seemed by its presence to maintain, by its carious or diseased state, incurable sinuses, purulent and exhausting discharges, and a condition of the joint irremediable by any other treatment.

In making this *seemingly* bold attempt for the speedy cure of a hitherto intractable disease, surgeons were, no doubt, quite aware, or at least ought to have known, that the caries affecting the femur was most usually a morbid affection, not confined to this bone, but was a disease affecting simultaneously, in many cases, the pelvic bones entering into the composition of the joint; that the os innominatum, in fact, was quite as liable

to constitutional or scrofulous caries as the femur itself; that both are, unhappily, most frequently simultaneously affected, and that the removal of the femoral portion of the disease (the pelvic part being beyond the reach of excision at least, if not of any surgical treatment) by no means warranted the inference, that disease in the pelvic portion would in all cases be arrested, and a speedy and safe cure be effected. But practical men were also aware, that the simultaneity of femoral and pelvic caries was not uniform; that a period arrived, sooner or later, in the progress of the disease, when surgical measures seemed indicated; and that an improved operative surgery, based on a more exact anatomy, and a sounder physiology, due chiefly to Mr. Hunter, enabled modern surgeons to attempt and execute operations with success, which in former times were never thought of.

Whilst opinions were in this conflicting state, clearly from a deficiency of facts or materials which alone could decide important questions like these, it was natural for the operative surgeon to say, "in youth constitutional disease of the joints is frequent; such diseases, when left to themselves, but too often terminate in destruction of the limb, or death of the patient. But experience has shown, that when scrofulous caries attacks the extremities of the bones forming the elbow-joint, the removal of the diseased portions of these bones is a comparatively safe and effectual operation, leading to the most beneficial results." From the elbow-joint, on which so many successful operations have been performed, an application of these views was readily made to the ankle, wrist, and other joints, remote from the trunk. The knee-joint followed as a matter of course; lastly, the shoulder and hip-joint itself. That objections should be made to rash operations on these large and important joints was naturally to be expected and approved of by the cautious; but we shall find that the objections in the main lay against rash operations merely, and not against those undertaken for the preservation of life or limb.

As the chief object of this memoir is to consider the question of removal of a portion, larger or smaller, of the pelvic extremity of the femur in cases of scrofulous, or as it is sometimes called, constitutional caries, I shall first consider this point alone; in a shorter section, I shall venture a few remarks on the excision of portions of the same extremity of the femur, in cases which, whether affecting merely the trochanters, or implicating the joint itself, cannot be so readily included under the same category. I allude, in a word, to caries of the trochanters, neck, and head of the bone, occurring in the adult, at a period when it is presumed the constitutional tendency to scrofulous disease may or must have ceased.

I pretend not to offer any opinion of my own in a dogmatic way; the truth is, that no facts or materials have been collected to enable any surgeon to do so, whatever may be his standing in the profession. "At what stage of the disease of the hip-joint may the operation of removing the head of the femur be performed?" By "head of the femur," I do not mean exclusively the part called the head. Scrofulous caries of the pelvic extremity of the femur is not confined to the head; the pathological condition in question extends, unhappily but too often to the neck and trochanters. Of the co-existing pelvic disease I shall speak presently.

In hip-disease, then, it may be found necessary to remove by operation, not merely the head of the femur, but the adjoining portion of bone, the neck, in brief, and the trochanters.

The question I propose here for solution is more complex than will at first appear. It involves two others at least, which it is not my intention to discuss at any great length in this memoir. The first is, in what number of cases of hip-disease, whether the disease be the true morbus coxarius, the scrofulous caries of the bones forming the joint, or the more obscure affection attacking the adult, is pelvic and femoral caries simultaneous? Secondly, how is this simultaneity to be detected? And, thirdly, (for this question also merits the deepest attention from the surgeon,) does the co-existence of pelvic and femoral caries forbid all attempts at operation?

To answer all or some at least of these questions, regard must be had, first, to the local malady, and secondly, to the system at large. I shall endeavour in the course of the following observations not to lose sight of any of these questions, although it is not my intention to discuss them systematically.

1st. Without pretending to establish any rigorous line of demarcation between caries attacking the adult bone and the constitutional form of disease, known by the name of morbus coxarius, it is nevertheless certain, that when caries attacks the adult it is usually an intractable and incurable disease otherwise than by surgical means, and these must be of a bold character. No constitutional treatment will answer, because we do not know in what the constitution is at fault. When this form of disease attacks the adult bone, it may and does persist and continue until death closes the scene, thus enabling the surgeon to ascertain, by post mortem examination, that the diseased or carious portion of bone could be covered with the extremity of the finger. The head of a trephine or a red-hot iron applied to the part during life would have saved the patient. That such an occurrence as this might happen even in scrofulous caries I do not doubt, although generally the caries is in such cases much more extensive.

Mr. Walton met with a case of caries of a small portion of the neck of the femur, which had persisted for seventeen years, and at last destroyed the patient. Mr. Syme, in the 'Edinburgh Medical Journal, Vol. XXXVI.,' speaks of a thigh-bone in his possession which he had taken from the body of a woman who had laboured under caries of the trochanter major of the femur for thirteen years; and the following observations bearing on this point occurred to myself very early in my professional career.

In 1816, I had charge, with others, of the detachment hospital then existing at Melsea, in Hampshire. It was an hospital which had been established there to relieve the adjoining garrisons of Portsmouth, Portsea, and Gosport, by receiving invalids coming from abroad; for the reception, also, of acute cases of disease from the regiments in garrison, whenever the regimental hospitals became crowded with sick. Among the patients and invalids thus received into Melsea Hospital was a soldier of the 14th, named Wigby. He had laboured for nearly three years under a disease which was entered on the books as morbus cox-

arius, treated as such, and held to be a disease of the hip-joint, hopeless therefore, at that period, and irremedial by any medical or surgical means. At that period no proposals had been made by surgeons to excise the head of the femur under any circumstances whatever, and it was not with that view that I proposed to operate; but I felt convinced, from a variety of circumstances, that the joint was not implicated, and that the caries was actually confined to the upper and outer surface of the greater trochanter; but receiving no encouragement whatever from any of my colleagues, no operation was attempted, and the patient shortly afterwards died exhausted. On dissection, it appeared that the caries which destroyed this young soldier was limited to the outer surface of the greater trochanter; was not larger than a sixpence, and might easily have been removed with a file or with the head of a trephine. Around the caries new bone had formed to some extent, similar to what happens in necrosis around the sequestrum. The preparation was lately in the museum of Chatham. The hip-joint was perfectly sound.

The second case which occurred to me strongly resembled the one just described; it occurred in 1825 or 1826. The patient was a farmer in Roxburghshire, and the case was to me so clearly a case of caries of the great trochanter, that I at once proposed the excision of that portion of the bone, the hip-joint being quite sound. As the gentleman had suffered greatly from exhaustion, it was proposed to remove him from his residence to the sea-side within a short distance of Edinburgh, with a view to his being near the surgeon, and also for the recovery of strength. The patient, however, fell into the hands of Mr. Liston, one of the great cutting surgeons of the day. He took advantage of the proposal sanctioned by my diagnosis, proceeded to operate at once, without informing me of it, and prior to the recovery of any strength; the patient, as was to have been expected, died. On dissection it was proved that the disease was confined to the trochanter major, the joint being perfectly sound.

It has frequently happened to me to observe on the bodies of healthy working persons, who had died from various acute diseases, fistulous openings, which, though small, had evidently persisted for a long period. When such fistulæ have occurred in the limbs, I have traced them most frequently to some small and seemingly superficial caries in a deep bone, (femur, tibia, etc.). so small that the whole disease might be covered with the point of the finger. The disease being incurable by any other but surgical means, continues, without extending, for years, the patient in the meantime enjoying very good health. At other times, however, the constitution gives way, exhausted by the discharge. No one can question the propriety of operating in such cases.

I now return to constitutional, or scrofulous caries, in which, although the disease may occasionally be confined to the trochanters, it unhappily more frequently extends to the joint itself, involving not merely the pelvic extremity of the femur, but the acetabulum itself. Should it appear after death that the vertebræ themselves were implicated in the disease, such a discovery need surprise no one. But let it be remembered, in criticising operations performed on femoral caries, complicated

with disease of the vertebral column, that caries in these vertebræ is not an absolutely incurable disease, and that the operation, by removing at least one source of suffering, and that the greatest, does not necessarily aggravate the case nor reduce the chances of ultimate recovery.

Case 5.—Jessie Buller, aged 12. There is morbus coxarius, with dislocation of the femur. The operation of excision of the pelvic extremity of the femur was performed on the 12th October. On the 18th Dec. the patient was doing well. The head and cervix of the femur were carious, and the acetabulum was filled up with a soft, granulating mass, rendering it impossible to say whether or not the bone had been, in the first instance, diseased. Six months after the operation the patient died. She sank under the effects of a double psoas abscess, connected with and caused by caries of the lumbar vertebræ and of the sacrum. These facts were brought to light by a *post-mortem* examination. (See Mr. Cotton's case in 'Medical Gazette' for December, 1849, and July 6, 1850.)

Under more favourable circumstances this patient would have recovered. The thorax and the abdominal viscera were healthy, and nature had attempted to form a new head of the femur and a new joint, with diminutive trochanters for the attachments of muscles.

Case 6.—Humphreys, aged 8. There was morbus coxarius, with dislocation of the head of the femur. The operation was performed in 1847, and the patient recovered so far as to be able to move about on crutches whilst in King's College Hospital. Being sent to the country he improved in health, and in progression he could even use the limb by placing the toes on the ground. On his re-admission to the hospital, during the following summer, he had greatly improved in his general health, but there was a sinus above Poupart's ligament from which was a copious discharge. The abdomen swelled, and he died in August, 1849, nearly two years subsequently to the operation. On dissection it was found, as was to have been anticipated, that pelvic caries existed; the acetabulum was rough and carious, and perforated at one point. The liver was large and fatty; the state of the lungs is not mentioned in the report of Mr. Smith. It is further mentioned in the report, that "the head of the femur was rounded, and firmly bound to the dorsum of the ilium by a strong band of fibrous tissue." A new head must have formed there, and in some measure a new joint. A residence at the seaside, under favourable circumstances, would no doubt have restored this patient to health, notwithstanding the untoward symptom of a diseased acetabulum. Patients recover from caries of the vertebral column much more extensive than the pelvic caries was found to be in the above case. The operation prolonged life, and the patient ought to have recovered.

Before I advert to the two cases operated on by Mr. Walton, I shall venture to make a few further remarks on some cases which have occurred to others, and been operated on with various success. The first of these which I intend noticing here, is the earliest, perhaps, on record, and one, therefore, meriting particular attention. The operator was Mr. White, and the details to which, however, I need not advert at any great length, are exceedingly interesting. The brief history is as follows:—

Case 7.—John West, aged 8. Affected with morbus coxarius and dislocation of the femur. Excision of the head and neck of the bone was performed by Mr. White, and the head and cervix were stated to have been but slightly carious. But their carious state may fairly be doubted, and it is unquestionable, although the important conclusion has escaped commentators on the case hitherto, that the disease had ceased to exist prior to any operation. But great deformity existed, to remove which was Mr. White's sole object in operating. So far, then, in this celebrated case, the operation was perhaps unwarrantable, as there really was no disease, the subcutaneous section of the adductor muscles being no doubt the proper remedy. Still the case did well, and stands recorded as a successful operation for morbus coxarius, which it was not. (See Cooper's 'Surgical Dictionary,' art. 'Bones.')

Case 8 Has reference to a lad aged sixteen, affected with morbus coxarius, and dislocation of the head of the femur. This was a bold and successful operation. It was found, on operating, that the head of the femur was carious and wasted, and the acetabulum had suffered from the same disease. It was rough and bare, and, during the operation, Mr. Fergusson used the gouge. This patient recovered about a year after the operation; he was then moving about with the aid of a stick in a way which surprised every one.

It would thus appear, that pelvic disease, when not far advanced, offers no absolute objection to the excision of the head and neck of the femur in morbus coxarius. Incredible as it may appear to some, it recovers readily enough from constitutional caries. I have my doubts as to the extensive regeneration of structures; that this takes place sometimes may be admitted; but another process, namely, the healthy consolidation of the bone, and its conversion into an ivory or porcelain-looking structure, extending from the originally cartilaginous surface to a greater or less depth into the bone, will be found, I think, to be the more usual process towards a cure after dislocations from morbus coxarius and other diseases, destroying the cartilages and synovial surfaces of bones.

Other operations and other cases have not been so fortunate; that is, I presume, the materials for a correct diagnosis were wanting.—*Med. Times, June* 18, 1851, *p.* 689.

78.—ON AMPUTATION OF THE FOOT AT THE ANKLE-JOINT.

By W. Fergusson, Esq., F.R.S., &c.

It may with truth be said to be peculiarly characteristic of modern operative surgery, that we avoid to the utmost of our power all great mutilations,—that, instead of amputating a considerable part of the body for a diseased joint, we are content, and indeed find ourselves able to cure the patient, by cutting out the diseased parts, and leaving him a more or less useful limb. Although this view regarding the objects of operative surgery cannot be said to be novel, it must be admitted that

conservative surgery is more in the ascendancy than ever, and it is a very good step in advance. I remember the time when, for disease of the ankle-joint only, the surgeon amputated the greater part of the leg, cutting the limb off just below the knee-joint; and I have myself often removed the leg for disease of the tarsus. Now, I hold it to be a sound maxim to preserve for the patient, while removing the diseased part, as much of the sound body as we possibly can, and the less of it we take away the more creditable is it for surgery. Again, I believe it to be a good and safe principle in surgery, that we should operate as far as possible from the trunk, and that by so doing we are putting our patient to less hazard; the shock of the operation will be much less; and this rule especially obtains with reference to amputations on the lower extremity. I believe it to be agreed among all surgeons, that the danger of the proceeding is lessened in proportion with the distance from the trunk. I speak, of course, in reference to the effects of the operative proceeding itself, and not to those accidental circumstances which may arise after any operation whatever.

For these reasons, then, I consider that amputation at the ankle-joint should always, when possible and proper, be put in force, instead of the old proceeding of removing a great part of a sound limb.

I have been particular in bringing this operation before your notice, because I think it creditable to surgery; and I am sure that if you should, in the course of your future practice, find it necessary to perform it, you will find it answer admirably, and, moreover, bring credit upon yourselves. But, although of late so much has been spoken, and so much has been written, respecting the advantages of this proceeding, I fear that it is by no means so well known and understood as it ought to be: certainly, if known, it is not practised so frequently as it should be. We see and hear of surgeons who still keep to the old method of amputating the leg for simple disease of the foot or ankle-joint.

Now, to show that this operation is probably not performed so often as it might be by surgeons in this metropolis, I may state, that Mr. Syme, in his comparatively limited sphere of observation—that is to say, as one of the Surgeons to the Royal Infirmary in Edinburgh, a city containing about 200,000 inhabitants—has performed the operation more frequently than all the surgeons in London put together. I have had eight cases myself; my friend, Mr. Busk, of the *Dreadnought*, has had the same number, I believe; and beyond these, I do not think that there have been half-a-dozen instances of this operation altogether. This, as you see, gives a very small proportion to what has been done in Edinburgh; and it would appear from this, that either there must be a great many more cases in Scotland requiring this operation, or there must be much less of this sort of surgery here in London. I place no importance on the insinuation, that the operation may occasionally be done in the north in instances where there is no absolute necessity for such a proceeding. The same practice has been resorted to by other surgeons in Edinburgh, as well as in Glasgow; and I have such a high opinion of the surgery north of the Tweed, both in the Royal Infirmary of Edinburgh and elsewhere, that I should consider myself an unworthy disciple, were I not to express my humble opinion in favour of the school from which I have

myself derived so many advantages. From what I have observed, I should say, that surgeons here are not sufficiently impressed with the utility and superiority of this proceeding; and I am convinced, that amputation has been done frequently in the leg for diseases of the foot, when amputation at the ankle-joint might have been substituted with ease, and would have sufficed for the thorough removal of the disease.

What, then, are the advantages of this operation, you will ask, to counterbalance those disadvantages which have been urged against the proceeding, namely, its difficulty, its protracted nature, and also the liability there is to the lapse of a long period before the stump perfectly heals? To this I would bring two most cogent answers. In the first place, by adopting this operation instead of amputating in the leg, we preserve a great portion of the limb which is in a sound state, and nevertheless gain the same object, namely, the removal of the disease and the restoration of the patient to health. Secondly, I have no hesitation in saying, that the stump is the best that can be made in the lower extremity. You must bear in mind that I am only here alluding to those cases in which amputation of the foot is imperatively demanded.

Whilst making these observations upon the superiority of this operation, it would not be right in me to lead you to suppose that it is invariably successful, or that it is not sometimes attended by fatal results. Of the eight patients I have operated upon, two died after it; in one of them death followed directly from the proceeding in a few days, as it would ensue after any other amputation; great irritation and inflammation ensued, and quickly carried the patient off. In the second instance, it would not be fair to put the issue to the operation itself, as the fatal termination did not happen until several weeks after, and it was due to disease of the lungs, which had rapidly supervened after the foot had been removed. In some of my cases which have recovered, there have remained for some time those chronic sores which one frequently sees in a stump, or after excision of a joint for carious bone; but I lay no stress upon this matter, for it often happens that, when the skin has been diseased, even after the removal of the carious bone, sinuses will take some time in healing up: and I would beg of you to remember, that the fact of there being ulceration of the soft parts which are to form the flap, is no valid objection either to the excision of bone or to this operation. I am fully aware that surgeons refuse to do this amputation at the ankle when the soft parts are swollen and ulcerated; and I believe that this is one reason why it has been so little adopted, for there is nearly always a good deal of disease of the integuments in a case of caries of the ankle-joint or tarsus. But it is a very erroneous notion to believe, that this will act as any objection to the proceeding,—the disease in the soft parts is entirely produced and kept up by the irritation of the carious bone;—take the latter away, and the soft parts will, sooner or later, regain their natural condition. You recollect the last case in which I performed excision of the elbow-joint; there was most extensive disease of the soft parts around, through which it was necessary to make the incisions in the operation; nevertheless, after the carious ends of the bones had been removed, the parts resumed a most healthy condition; and the swollen condition, as well as the improvement

afterwards, were so remarkable, that I had casts of the arm taken both before and after the operation. It has been the same with this last case of amputation at the ankle-joint: the disease in the soft parts was very great; but look, now, at the stump, and you will see how healthy the skin appears. Bear this point in mind,—it is of the greatest importance; it is a principle that you cannot too firmly press upon your minds, that disease of the soft parts around a carious joint is caused and kept up by the condition of the bone; and that, when this latter is removed, the former will resume a sufficiently healthy state to make a good covering. I particularly draw your attention to this point, as I feel certain it is not sufficiently acknowledged, or at least, attended to.

Before concluding, I will just make an observation on one other point. You have seen that a slough took place in the middle of the lower flap in this case. Now, sloughing has not unfrequently ensued in the lower flap after this proceeding, but it has usually attacked the anterior edge of it, not the centre, as in this case. But you will readily understand how this was the case; the cicatrix of the wound made in the former operation was seated here, and of course the circulation was less healthy at this point; consequently, some sloughing took place there. Sloughing of the lower flap has often been observed; and, in order to obviate this, Mr. Syme has recommended a shorter flap than he at first made; and I have sometimes made even a shorter one than recommended by that gentleman. Here (showing a cast) is an instance where I carried the incision just over the posterior edge of the lower surface of the os calcis; a capital stump was made, and no sloughing occurred. It is desirable to make the flap no longer than is absolutely necessary. I have now drawn your attention to most of the points connected with this operation, which I strongly recommend to your notice; for by it you can remove effectually a serious disease from your patient without sacrificing a considerable portion of a limb which is in a sound state, and which may prove very serviceable to him afterwards.—*Med. Times, June* 14, 1851, *p.* 640.

79.—ON THE OPERATION OF AMPUTATION AT THE ANKLE-JOINT.

By Richard G. H. Butcher, Esq., Examiner on Anatomy and Physiology in the Royal College of Surgeons, Ireland, &c.

The operation at the ankle-joint is no new thing. Mention has been made of it at a very remote period; it was, I think, first performed by Sedellier, and strongly advocated by Velpeau and many other French surgeons, both by antero-posterior as well as lateral flaps; but certainly to Mr. Syme is due the merit of having revived it altogether under a new aspect, by refuting the strong objections urged against it from the extent of the articulating surfaces exposed, and the scantiness of covering for the bones. The former he has lessened by the removal of the malleoli, as first practised by M. Baudens, together with the intervening cartilage; and the latter he has shown can be supplied by an efficient flap from the dense tegument and tissues of the heel. The operation

was also strongly opposed on the supposition that the exterior muscles of the ankle, acting through the tendo Achillis, when no longer antagonized, would draw up the heel, and point the cicatrix to the ground. Such a result cannot take place, Mr. Syme says, as the cut extremities of the tendons on the fore-part of the joint speedily require new attachments, enabling them to counteract the extensive power. Well, to a certain extent this proposition maintains, perhaps sufficiently so for all practical purposes; yet I have now before me a second cast, taken from the patient Flynn, just before I operated below the knee, an interval of three months having elapsed, and during which time he was hopping about on crutches, with the leg hanging, and the stump in every movement dragged on by the powerful muscles of the calf, not only during his efforts by this mode of progression, but also while he made ineffectual attempts to walk. On contrasting it with that taken on the former occasion, the result contradicts Mr. Syme's assertion that no change takes place in the line of the cicatrix. It is here demonstrated a full half inch lower; but, as I have before noticed, for practical purposes, this need not be taken into consideration, as it is improbable the parts on the anterior aspect of the stump would have yielded any more.

One of the advantages promised by amputation at the ankle-joint, instead of the operation near the knee, according to Mr. Syme, is "a more comfortable stump will be afforded." In the case just detailed, we have evidence that the stump was perfectly formed in its most favourable proportions. The patient left the hospital with the cicatrix healed, and, as readily would have been supposed from an inspection of it, complete in every respect; yet what is the disheartening result? Why, that, after weeks of the gentlest trial, the cicatrix breaks out afresh, the limb becomes inordinately swollen, intense and burning pain fixes in the stump, occasioning restless nights, and days of torture, and lastly he supplicates for its removal altogether.

The dissection of the stump reveals the causes of all his sufferings, and is extremely interesting. On lifting the indurated integuments, the subjacent layer of granular fat seemed more matted to the fibrous textures and firmer in its consistence than usual. The insertion of the tendo Achillis was so closely applied to the plantar fascia that it presented the appearance of dividing into three dense fibrous bands, passing from behind forwards to the cicatrix. These bands, on the most convex part of the stump, were separate from each other about half an inch; the spaces between were depressed and filled with fat. On making a section of the cushion from behind forwards, exactly in the mesial line, its depth was fully three-quarters of an inch, its structure fibrous, and eminently springy and elastic; this, together with the integument and fat removed, constituted a covering for the bones of an inch and a quarter thick, and formed of tissues most admirably adapted for the end in view. On examining the cicatrix, the anterior extremities of these fibrous bands, or three divisions of the plantar fascia, were fused into the cut extremities of the flexor tendons, the union between them being short and decided, and hence the improbability that the cicatrix would have descended any more by the action of the extensor muscles. On drawing away the cut surfaces, it was quite apparent that inflam-

mation, terminating in ulceration, had attacked the cartilage over the articulating surface of the tibia, and also the end of the fibula, from which the external malleolus was removed. The cushion was not adherent to either; it remained firmly attached, however, to the tibia, where the internal malleolus was sawn across. In addition to the increased vascularity of the bones and structures around, there was a delicate adventitious membrane, which was capable of being lifted up, spread out over the eroded cartilage; red vessels permeated and traversed it in all directions, many of them visible to the naked eye, whilst with the assistance of a lens they appeared as a complete vascular net-work. Coexisting with this condition of the interior, ulceration was also eating its way round the margin of the cartilage. The morbid appearances presented in the parts were brought on, I have no doubt, by the patient's reiterated attempts to move about; and the darting pain occasioned along the thigh, when undue pressure was made at the inner side of the cicatrix, is referable to the bulbous condition of the nerve, for in this specimen it is very firm, and expanded to the size of a large almond. This pathological condition of the nerve, after amputation of the ankle-joint, is totally at variance with Mr. Syme's prediction when dilating on the advantages of the operation.

In the case just detailed I had no choice of site, the integuments being diseased; if I had, I should have preferred operating at the middle of the leg, or a little below it, the practice comes so strongly recommended from Charles White, of Manchester, now revived and practised by Professor Fergusson, of London, and so ably and forcibly urged by Dr. Laurie, of Glasgow; in short, conservative surgery was never so much in the ascendency as at present, and no man can recognise or estimate the principle more fully than I do. Yet I think it still remains to be proved that the operation at the ankle-joint affords the most comfortable and useful stump to the labouring man, and promises less risk to life. No doubt many cases are on record where the operation was performed, in some instances attended by great success. Lisfranc mentions the case of a man on whom this operation had been performed, who could walk ten or twelve miles a day with great ease, and a few similar cases are recorded by Professor Syme. In most of the published favourable cases, however, we have evidence of a prolonged confinement for the healing of the stump; but after this no reference is made to its usefulness in progression, neither have we full statistics as to the mortality attending it. I have seen the operation performed three times, and in no one case was it attended with success.

Professor Fergusson has written "On the Amputation of the Foot at the Ankle-joint" in the 'Medical Times' [see p. 231 of this vol.] and speaks most favourably of the proceding; yet he tells us:—"Whilst making these observations upon the superiority of this operation, it would not be right in me to lead you to suppose that it is invariably successful, or that it is not sometimes attended by fatal results. Of the eight patients I have operated upon, two died after it; in one of them death followed directly from the proceeding, in a few days, as it would ensue after any other amputation; great irritation and inflammation ensued, and quickly carried the patient off. In the second instance, it

would not be fair to put the issue to the operation itself, as the fatal termination did not happen until several weeks after, and it was due to disease of the lungs, which had rapidly supervened after the foot had been removed." This mortality, then, twenty-five per cent., I look upon as very considerable, more particularly when occurring in the hands of this distinguished surgeon. It is greatly to be regretted that Professor Fergusson did not allude, in his lecture, to the present condition of the remaining six of his cases, whether the stump in each case fulfils efficiently the object for which it was intended, and whether any of the patients solicited amputation in preference to being incumbered with a useless limb.

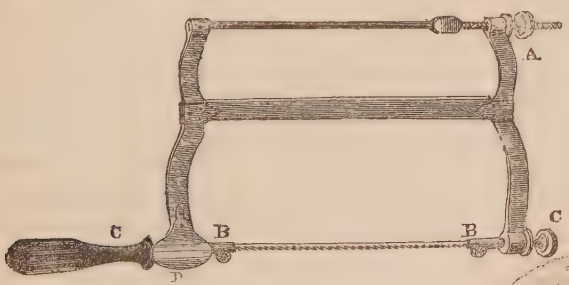
From my own observation, and the facts now detailed, I do not consider this operation at all so applicable to the poor labouring man as to the wealthy sufferer. The latter may at will relieve the stump from pressure, by expensive mechanical contrivances, horse and carriage exercise, &c., &c.; whilst the former, no matter what amount of uneasiness he may experience in the part, must endure and struggle on for subsistence, and probably in the end have to submit to another operation. —*Dublin Quarterly Journal of Med. Science, Aug.* 1851, *p.* 216.

80.—ON THE APPLICATION OF A NEW SAW IN AMPUTATIONS.

By Richard G. H. Butcher, Esq., Examiner on Anatomy and Physiology in the Royal College of Surgeons, Ireland, &c.

[Mr. Butcher describes it as follows:]

The saw which I most strongly recommend now, for the first time, to the profession, is a modification of the bow-saw used by cabinet-makers for cutting out fine work, when curves are to be executed. The construction of the instrument will be readily understood by the description appended to the wood-cut, in which the saw is exhibited on a very reduced scale.



A, the nut applied to the screw, which makes tense the blade; B B, the pins that secure the blade in the sockets; C C, the handle and nut, by turning which the blade is rotated to any angle; D, the rest for the index finger.

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The measurement of the full-sized instrument is as follows: the upright pieces are six inches high, half an inch wide, and two lines thick; the one remote from the handle is received into the transverse bar, and is moveable; the depth of the blade is three lines, with the teeth well set off from each other, and inclined forwards; the length of the blade is six inches, with the sockets included eight inches and a half; the middle bar is half an inch deep, and two lines thick, and the upper bar is rounded, with a screw at one end.

The instrument, for amputation of the leg and thigh, I have had made of the above proportions, but is also executed on a smaller scale for minor operations. I have also, at this moment, in the hands of the cutler a saw preserving the same proportions of blade, with a screw to make it tense, directly attached to the remote socket from the handle of the instrument; by this contrivance the upper bar, and a great proportion of the uprights, can be done away with, so as to render it more portable.

The advantages which I conceive this saw possesses over every other, are the following: from the extreme shallowness of the blade, it readily cuts in a curve, if required; and from its slender proportions it can be easily slipped under the flaps and used without bruising them, or catching in the retractor. No matter how unsteadily or unevenly the limb is supported and held by the assistant, the saw cannot be locked: the thin shallow back, the fine setting of the teeth, the mode in which they project to either side, all contribute to prevent the possibility of such an occurrence, for a perpendicular section of the blade shows it to preserve a triangular form, the base below, therefore the instrument must work freely in the groove which it has made. It cuts more evenly than any other saw, and the bones cannot be splintered by it, consequences resulting from the fineness of its setting, and the lightness of the instrument; and lastly, it cuts more rapidly than any other saw, owing to the extreme tension of the blade, produced by acting on the screw in connexion with the upper bar of the instrument; the effect being perfected in a very material manner by the mode in which the blade is riveted in a direct line with the teeth.

This saw will be found extremely useful in every instance where a saw is required, and particularly in amputation of the lower jaw; for, by relaxing the screw above, the sockets in which the blade is lodged are permitted to rotate, so that the teeth may be directed outwards, while, by unscrewing the pin marked B, the blade is readily detached, and being sharp at the point, is easily passed behind the bone, with its edge applied to it, or at any angle required; the blade is again fastened at B, and when made tense, a few movements of the instrument will readily sever the bone from within outwards.

Again, owing to the facility it affords in cutting curves, it is peculiarly applicable for removing exostosis, cutting out the great trochanter of the femur, &c.—*Dublin Quarterly Journal of Med. Science, Aug.*, 1851, *p.* 214.

ORGANS OF CIRCULATION.

81.—DEEP PENETRATING WOUND OF THE CALF OF THE LEG, BY A REAPING-HOOK, FOLLOWED BY PROFUSE HEMORRHAGE.

By E. L. Hussey, Esq., Surgeon to the Radcliffe Infirmary, Oxford.

[This wound was produced accidentally, by means of a reaping-hook, upon the person of Isaac Carter, 66 years of age, and of feeble general appearance. It is described as "on the middle of the back part of the left leg, extending in a transverse direction about two inches, penetrating deeply into the muscular substance." On Mr. Briscoe, the house surgeon, removing the handkerchief which had been tied round the leg immediately after the infliction of the injury, a gush of arterial blood followed, and it was found that the wound extended further than the finger could reach, on the tibia and interosseous membrane, under the deep muscles.]

It was clear that some deep-seated vessel of magnitude was wounded, which it was imperatively necessary to secure; and as it did not seem prudent to wait, I proceeded to search for it, without sending to Mr. Hitchings, whose week of attendance it was.

A tourniquet being thrown round the thigh, and the man placed on his side, with the limb partly flexed, I made an incision about four inches long through the skin upon the inner edge of the gastrocnemius, over the course of the posterior tibial vessels, meeting the tibial extremity of the transvere wound at about a right angle, and, dividing the other tissues interposed, came at once upon the anterior tibial artery, both ends of which were seized and tied without difficulty: the distal extremity, though easily recognised, was not bleeding. The artery, as well the nerve, was completely divided by the original injury. The clots in the wound were then turned out, and some muscular branches which seemed inclined to bleed were next tied. Profuse hemorrhage still continued with violence, but of a dark venous character, welling up from the bottom of the wound; this, however, became lessened on removing the tourniquet. To get at the source of it I enlarged the wound upwards toward the knee, and some bleeding points were tied upon a tenaculum,—an operation of great difficulty, from the patient's restlessness and the depth of the wound. One vein, larger than the rest, and apparently in close connection with some tendinous structure, seemed to be wounded at more than one point. Ultimately the hemorrhage was stopped by passing three ligatures, at intervals of half an inch, under this vessel and the surrounding tissues by means of a needle in a firm handle. The wound was drawn together with strips of plaster, a compress of dry lint placed on it, and the whole secured, and even pressure maintained by a bandage round the leg; and the patient, cold and perfectly pulseless, replaced in a blanket in bed. Wine and brandy were administered freely during the operation, and on his return to bed he was supplied well with hot brandy and water.

About nine o'clock at night Mr. Hitchings saw him: he was then warm; the pulse was weak, but distinctly perceptible at the wrist.

The finger placed on the dorsum of the foot distinctly recognised, for the first time, the anterior tibial artery: the posterior could not be felt. He was still as restless as ever, throwing himself about, and with difficulty kept in bed: he had twice torn the bandage off the leg, without, however, any return of hemorrhage. The muscles could be seen acting spasmodically under the bandage. A drachm of spiritus etheris sulphurici compositus, with forty minims of vinum opii, was administered in mistura camphoræ: it was speedily vomited, when a grain and a half of opium in substance was given and retained. He continued very restless till towards three o'clock in the morning, when he went off to sleep.

[On the succeeding day he seemed to have rallied a little. There was a slight watery discharge from the wound, tinged with blood. Beef tea and brandy and water were administered, and as no urine had passed, the catheter was introduced. On the 14th, however, fatal symptoms supervened, and he died quietly forty-eight hours after receiving the wound. On a post mortem examination being made, it was found the ligatures had been correctly placed on the divided extremities of the posterior tibial artery. The three additional ligatures had been placed upon one of the venæ comites. The tendon of the plantaris lying immediately over the vein had interfered with the application of the ligatures. It would have been better to have divided this tendon. The extremities of the vessel were nearly an inch distant from each other, owing to the retraction of the muscles. The cause of death was evidently from the inability of the system to rally from the severe loss of blood previous to admission.]

The chief point of interest in the case is, that it shows with what ease the posterior tibial artery may be exposed when necessary, in the upper part of its course, by cutting through the muscles covering it; and the unfortunate termination of the case does not seem a sufficient reason for withholding the publication of it. The operation, I venture to suggest, may be done by cutting upon the edge of the gastrocnemius, and then through the substance of the soleus, with less difficulty—as it seems more directly in the course of the vessel, which there lies at less depth—than by cutting as proposed by Mr. Guthrie, through the belly of the gastrocnemius as well as the soleus; though that operation seems more practicable than the older mode of cutting upon the edge of the tibia, and reflecting the muscles attached to it, notwithstanding the preference given by Dr. Harrison, of Dublin. This mode of operating was suggested to me some years ago by Mr. Coote. On the *dead subject* it appeared undoubtedly to be preferable, but I had not till now had an opportunity of putting it in practice on the *living*.—*Med. Gazette*, 1851.

82.—ON THE TREATMENT OF ANEURISM BY COMPRESSION.

By Jolliffe Tufnell, Esq., Surgeon to the City of Dublin Hospital, &c.

[Although Mr. Tufnell, on the part of his Dublin professional brethren, does not wish to discard the ligature, he still prefers pressure as the general rule in ordinary cases. He says:]

"I *consider compression applicable* to every ordinary circumscribed aneurism in an extremity, where there is sufficient room for the application of the compressing medium at two different points above the tumour, premising, of course, that pressure on the trunk of the vessel completely controls pulsation in the sac, thus proving that no high bifurcation exists.

"*I do not advise* it in cases which are rapidly extending in size, or where they continue to do so after compression has been tried. These aneurisms have no distinct sac; and to afford any chance of saving the limb, the blood through the main channel *must be cut off, and at once,* by securing the vessel.

"*I do not advise or sanction it* in cases where the disease has been allowed to run on unchecked, where the limb has become œdematous and swollen, and the surface of the aneurism a dusky, yellowish red. In such a case, the vein is most probably engaged, and if it be a popliteal aneurism, the knee-joint inflamed. Here, I believe, amputation is the only resource.

"Understand me, then: compression I advocate only in cases where the sac is entire, and where sufficient room exists for applying the pressure on two points of the artery above. At the same time, cases have so frequently occurred where the application of a single instrument has been sufficient for a speedy cure. (such, for instance, as one that I saw under the care of Dr. Hutton, where popliteal aneurism of a considerable size, was, in seven hours and a half, by means of a single instrument, constructed on Dr. Carte's plan, rendered completely solid,) that, although, for prudence sake, *and as a general principle,* I advocate the employment of two points of pressure, yet I by no means hesitate to employ a single instrument, and give the patient every chance, prepared at the same time to use the ligature, if any necessity arise."

In preparatory and constitutional treatment, Mr. Tufnell follows Dr. Bellingham. In selecting the instrument to be employed, he discards all but a conical weight from six to ten pounds, padded, laid upon the artery at the groin, and retained there by the patient's hand; with the elastic apparatus of Dr. Carte. In this apparatus, Indian rubber takes the place of, or rather relieves, the pressure of the unyielding screw; an important improvement, which, however, may be easily accomplished in various ways by those who do not possess Dr. Carte's instrument.

The author advocates such an amount of pressure as stops pulsation in the aneurism to the *touch,* in which case the ear will still detect the flow of blood into the sac. He urges us to employ the minimum amount of pressure with which *complete* command over the circulation can be obtained, with the view of obtaining a more rapid cure than when a wave of blood is permitted to pass through the sac; although in irritable persons less pressure may be attempted, as aneurism is cured by a mere diminution of the current of blood through the tumour. Cases are also quoted, proving that when it has been necessary to suspend compression, a curative action still goes on The temporary interruption to the current of blood appears to line the inside of the sac with a fibrinous deposit, which increases in thickness and completes the cure.

It is an important question to determine how far the employment of

compression interferes with the subsequent application of the ligature, should it be required from the intolerance of pressure or increase of the aneurism. Of course a careless practitioner might so injure the artery, that it would be dangerous to apply a ligature upon the part he had compressed; but Mr. Tufnell quotes from cases where an opportunity has been afforded of examining the limb after death, proving that no injury whatever was inflicted upon either artery or vein, at the spots where compression was applied. He quotes from other cases, in which compression was given up and the ligature employed, the previous use of compression in no way affecting the operation in its results.

That compression is an *effectual* cure for aneurism, is proved by the fact that, during eight years, the ligature has only been used three times in Dublin, either in hospital or private practice, in two of these cases the aneurism being traumatic. During this period, compression has been employed in 39 cases. In 30 of them, a perfect and complete cure was the result. In one, compression was discontinued, and the tumour did not increase in size. In two, the ligature was used successfully. In three, amputation was necessary, the patient surviving in each instance. Three patients died; one from erysipelas, and two from disease of the heart. It is quite clear, from the details of the cases in which amputation became necessary, that the ligature would not have lessened the necessity for removal of the limb; but, on the other hand, would have almost certainly induced gangrene, and thus lessened the probability of saving the patient's life. The death from erysipelas occurred during a prevalence of this disease in the hospital, galvano-puncture having been employed, and the patient himself having unduly increased the amount of pressure.

The average duration of treatment in these cases, was twenty-five days. The average of the eight most favourable cases was only twenty-eight hours. In one case, seven hours and a half only were required for total solidification of the contents of the sac. There can be no doubt that, from the admission of a patient to the time he leaves the hospital, after the employment of the ligature, a longer average stay than twenty-five days takes place, and that a very speedy cure cannot be hoped for.

Statistical returns of the success of the ligature give the following results:—

"In Dr. Crisp's work are detailed the particulars of 188 cases, where the vessel was secured for popliteal or femoral aneurism. Of these—

Died from the effects of the operation	35
Recovered after suffering subsequent amputation ...	11
Recovered after sloughing of the sac...	2
Recovered after mortification of the toes	1
Recovered after sloughing of the integuments ...	1
	50

So that more than the fourth of these cases either terminated fatally, or were maimed for the rest of life.

"Mr. Phillips's experience and researches are the next to be considered. They are thus quoted by Mr. Storks: —'Mr. Phillips collected

171 cases of aneurism affecting the lower arteries, which were submitted to the Hunterian operation. Of these cases, 57 (or exactly one in three) were unsuccessful, in which all the patients except two died, not of the disease, but of the operation. Amongst the successful cases, secondary hemorrhage took place fifteen times. Fifty-nine of these cases required ligature of the femoral artery, 39 of which were unsuccessful; thus giving a mortality of two in three in the artery most frequently subjected to the operation.'

"Mr. Norris gives a fuller report, his table embracing 177 instances (155 of popliteal, and 22 of femoral aneurism) where the operation was performed. He gives the surgeon's name, the sex and age, situation of disease, its duration, periods when each operation was performed, when the ligature came away, (if fatal,) the date and cause of death, with reference as to where the particulers of each case are recorded. There is, then, no getting behind this collection, no stating, in general terms, that statistics are wrong, and cannot be relied on. If truth is spoken in the first published details, it is re-echoed in Mr. Norris's table.

"He gives, I say, 177 cases, of which—

Died from the effects of the operation	38
Recovered after subsequent amputation	6
Recovered after suppuration of the sac	10
Recovered after gangrene of the foot	2
	56

So that nearly one out of every three cases operated upon, either terminated fatally, or were, to a certain extent, maimed for the remainder of their lives."

[These returns will doubtless assist in convincing the profession, that compression must become the general, ligature the exceptional, practice in the treatment of aneurism.]—*Brit. and For. Medico-Chirurg. Review, October*, 1851, *p.* 468.

83.—ON NÆVUS.

By John Birkett, Esq., Assistant Surgeon to Guy's Hospital.

Case 1. *Very large Nævus of the right Arm,—spontaneous Atrophy.* [In January, 1850, an infant, 10 months old, was brought to the hospital. The whole of the right upper arm was of a deep purple tint, the external and anterior regions being most affected, the disease extending on to the shoulder, and slightly also to the chest, reaching downwards a little below the flexure of the elbow. On account of the age of the patient, pressure, and the liquor plumbi diacetatis dilutus, were applied. In April, the constitutional powers of the child were greatly reduced by an attack of measles, succeeded by whooping-cough. In October, the site of the nævus resembled a very large cicatrix after vaccine pustule, having a whitish opaque appearance. Mr. Birkett continues:]

I am inclined to think that the atrophy which has taken place in this instance must be attributed to the very low condition into which the

powers of nutrition were brought first, by the attack of measles; and, secondly, by the effects of the whooping-cough, which ensued so rapidly, indeed, before the constitution had recovered from the former.

I am induced to make this statement from having witnessed a similar case of atrophy in an infant under the care of Mr. Hacon, of Hackney.

This infant was the subject of a large subcutaneous nævus, occupying the side and the lower half of the face, and a portion of the neck. In this case, also, the extent of the growth, and the very tender age of the patient, precluded every idea of operation. This infant, a few weeks after I saw it, had a most severe attack of bronchitis, and Mr. Hacon informed me that after recovering from this pulmonary affection, the nævus became atrophied.

M. Vidal cites three cases of atrophy:—

1. Of a large cutaneous nævus on the cheek, which, by the advice of M. Moreau, was allowed to remain without any interference. About the age of seven or eight years it began to atrophy, and at twelve there was no trace of it.

2. Of a cutaneous nævus, equal in size to the first phalanx of an adult's middle finger, on the forehead of a female infant close to the anterior fontanelle. By M. Moreau's advice this was untouched, and at seventeen years of age there was not a trace of it.

3. Of an erectile tumour occupying the left labium pudendi, and extending into the vagina, which atrophied as the patient advanced in age. (Vidal, 'Traité Path. Ext.,' t. i, p. 426.)

In these cases it is not stated that the patients had any severe illnesses.

In correspondence with Mr. Henry Taylor, of Guildford, he favoured me with the following case and remarks:—

"There is a fact with regard to these vascular growths that I have observed several times; it is this, that they will go away of themselves, and it is a fact that I do not remember to have seen mentioned in surgical books, although of so much practical importance. One instance of it was so remarkable that I must relate it to you. A child was born in 1847 with a tumour on its head, near the vertex; it was the size of a walnut, of a spongy consistence, and had a sort of thrilling in it when compressed. The scalp was slightly discoloured over it, and there were some large arteries coming to it from the middle temporals, and these were fully as large as crowquills, tortuous, and pulsated visibly. I did not like to meddle with it at such a tender age, fearing the effects of hemorrhage, so the operation was deferred from time to time until it was found that the tumour was getting smaller, and at ten months old it had entirely disappeared. The other cases were the common cutaneous nævi, and in each of these, operations were meditated."

A case fell under my own observation of an infant born with several nævi on various parts of its body. They were left to nature, and have disappeared.

Cases, however, occur in practice in which it is neither prudent nor perhaps justifiable to induce the parents of the infant to delay the performance of some operation, with the intention of arresting the progress

of these vascular growths. The case next to be recited is such an instance, for it appeared that the disease was advancing slowly but steadily, and in a region of the body where the dimensions of the growth would render the complications which might therefrom arise a matter for serious consideration.

[The following case illustrates a method of treatment not much employed hitherto, whereby the nævus is strangulated, excluding the skin in the operation.]

Case 2.—Subcutaneous Nævus, or Growth of Erectile Tissue on the side of the Face, tied with a Subcutaneous Ligature. In July, 1850, I saw, for the first time, a female infant, eleven months old, having a swelling on the right side of the face. She was delicate looking and very strumous, born in Australia, and was still at the breast. The mother stated that the first suspicion of there being anything abnormal in the part, arose from the side of the face looking as if bruised. Believing that the child might have received some injury, she did not apply for medical advice until she discovered that the bluish tint increased rather than disappeared, and that the cheek assumed a somewhat swollen appearance. So difficult was it to form a diagnosis at first, that various opinions as to its nature were given, some thinking it chronic abscess, others medullary fungus, and some nævus. When the mother first remarked the blueness, the infant was about two months old.

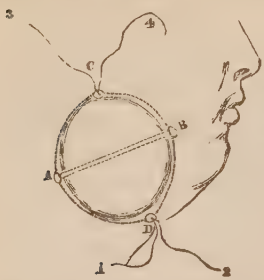
When I saw the infant in July, there was not, under certain circumstances, much difficulty in forming a diagnosis.

When the child was erect and the face in shade, there appeared to be considerable swelling of the right side of the inferior maxillary facial region, and a decided enlargement was perceptible on manipulation.

A large globular swelling extended from the lobule of the auricle half way across the inferior maxilla, and from an imaginary line drawn transversely across the masseter muscle downwards, into the upper cervical region. It was, in fact, external to the angle of the lower jaw. It communicated a peculiar elastic sensation when pressed, and with gentle pressure might be reduced in size. When, however, the pressure was removed, the tumour assumed its original volume. The colour of the swelling was of a very faint blue, and corresponded to that of the veins in other parts of the face, although the superjacent skin was perfectly healthy. Having concluded that the tumour was composed of the so-called erectile tissue, in fact, that I had before me a beautiful example of the subcutaneous nævus, I requested Mr. Cooper to examine the infant with me. He formed a similar diagnosis, and then we had to decide about the treatment. He thought it would be better to watch the progress of the growth, rather than immediately to have recourse to operation. This I did, seeing the infant from time to time, and always with the same result, namely, that the disease increased. In the beginning of September, the growth had made so much progress that Mr. Cooper agreed with me in thinking that delay was no longer admissible, and on the 16th I operated upon it, having the valuable assistance of Mr Francis Toulmin, who had seen the case from time to time.

The infant was placed under the influence of chloroform, and during nearly the whole time of the operation, she was under its effects.

Grasping the tumour with the finger and thumb, I passed a needle, armed with a silk ligature, transversely beneath the growth, and thus carried two ligatures from side to side.



I next passed the ligature 1 through he eye of a needle, and thrust its point from the first aperture A underneath the skin to C, where it emerged, and was drawn out. In the same way the ligatures 2, 3, and 4, were passed subcutaneously. The ends of the ligatures were next tied, as firmly as possible, at C and D, and thus the two triangular masses were constricted by the silk, without the skin being at any point included. (See Sketch.)

The bleeding was not very great after the tightening of the ligatures, although from one puncture a jet of apparently arterial blood came forth.

The irritation caused by these ligatures was not at all equal to what I had anticipated, and, with the exception of restlessness at night and irritability by day, the infant could not be said to have suffered very severely.

A discharge of pus soon appeared from each of the apertures, and continued in variable quantities from day to day.

At the end of a fortnight the ligatures had become loosened, and I passed a piece of bougie through the loop of each, by twisting which the tissues included in the ligatures were constricted. On the seventeenth day, both ligatures came away, and the discharge was of a healthy character. The side of the face was much diminished, and in the seat of the new growth a firm consolidated centre became perceptible. The blueish tint entirely disappeared, but there remained a slight redness over the old site of the nævus.

In October a little discharge flowed away; sometimes from one, at other times from another puncture.

I believe, however, the growth might be said to have been destroyed.

The health of the child did not suffer much, it became perhaps a little thinner, and on the opposite side of the neck there appeared an enlarged gland, probably depending on the strumous diathesis of the infant. This suppurated, discharged, and soon after healed.

For several weeks I believed that the disease was radically cured, but, to my disappointment, about Christmas, 1850, the same blueish tint and swollen appearance of the cheek reappeared, rather posterior to the original site of the disease, and of small size. The growth gradually increased, not to its former extent, but it became sufficiently manifest that a new development had taken place. I did not propose further interference, and for the last few months no increase has arisen. But it is somewhat remarkable that the skin over the nævus, before quite unaffected, now presents some minute bright red ramifications of blood-

vessels. The cicatrices of the holes made by the needles are scarcely perceptible.

The subcutaneous ligature of Ricord has been now employed in various forms in the treatment of these cases, and the first I find is by Professor Pitha, who, in 1844, with great success made use of it to destroy a vascular tumour on the forehead of a young man twenty years of age. The growth was encircled by a single ligature. (Vierteljahrschrift für die prak. Heilkunde. Prag, 1847.]

Mr. Curling has also devised a plan of proceeding in those cases in which the preservation of the skin is important, by passing a single ligature subcutaneously. (Medical Gazette, 1850.)

And since I performed the operation related above, Mr. Adams has attempted to cure an abnormal development of this kind by the same means. (Med. Times, Feb. 1851, p. 178.)

The following methods of treatment for the cure of nævi have each their advocates, and are more or less beneficial, according as the nævus may be of the cutaneous, subcutaneous, or mixed variety.

They may be severally arranged under the three following heads:—

1. To induce or await atrophy of the new growth, by—
   - *a.* Compression.
   - *b.* Astringents or refrigerants.
   - *c.* Ligature of the vessels of supply.

2. To excite inflammation in the tissue of the nævus, and thus obliterate the cells of the new tissue, by—
   - *a.* Seton.
   - *b.* Acupuncture.
   - *c.* Laceration of the tissue by punctures.
   - *d.* Incision and the insertion of sponge.
   - *e.* Cauterisation with potassa fusa, chloride of zinc, &c.
   - *f.* Injections of stimulating solutions.
   - *g.* Punctures, with a probe coated with argenti nitras.
   - *h.* Vaccination.
   - *i.* Punctures, with a lancet's point covered with croton oil.

3. The entire removal of the new growth, by—
   - *a.* Excision of the disease only.
   - *b.* Amputation of the part affected, as of lips, prepuce, labium pudendi, fingers, &c.
   - *c.* Ligature in various ways.
   - *d.* Complete destruction with caustics.

In the case I have related, I was led to employ the subcutaneous ligature, in consequence of the position of the morbid growth; for to have included the skin, which was perfectly normal, would not only have rendered the operation more formidable, but, by causing extensive destruction of the integuments, would have given rise to a frightful cicatrix, even supposing the healing had been perfect. The plan adapted has not, moreover, in any way interfered with the performance of another operation, should the growth increase to such an extent as to demand further interference. — *Guy's Hospital Reports, Vol.* 7, 1851, *p.* 291.

84.—CASES OF NÆVI.

Under the care of Mr. Erichsen.

Nævus of the anterior fontanelle.—A child, six months old, strong and healthy, was admitted, under the care of Mr. Erichsen, Nov. 1850, with a nævus on the anterior fontanelle. The tumour is almost as large as a pigeon's egg; it occupies the whole of the fontanelle, extending over the osseous boundaries of this space on the left side. The heaving of the brain can be distinctly felt underneath it; there is no pulsation in the tumour, but several large veins are seen running from it on each side. The mother states that she noticed the discolouration of the skin shortly after birth; it increased rapidly since that period, and almost visibly during the last fortnight.

Mr. Erichsen resolved to use the ligature, seeing the size and prominence of the growth; but the difficulty in the application of this means consisted in passing the threads across the base of the tumour without wounding the membranes of the brain, which lay in immediate contact with it. This difficulty Mr. Erichsen overcame by using a blunt-eyed probe to convey the threads, instead of the common nævus needle. A puncture was therefore made about an eighth of an inch above the tumour, and an eyed probe, conveying the whipcord, was pushed across the base of the mass. Mr. Erichsen then cut down upon its point when it projected below the tumour, and then drew it across; the transverse threads having been carried through in a similar manner, the knots were tied in the usual way, and the mass firmly and effectually strangulated: the child having been under the influence of chloroform suffered no pain. The threads and sloughing mass separated in three days, leaving a healthy granulating surface, which speedily cicatrized.

[Mr. Lloyd treats nævi by destroying them by potassa fusa freely applied for a few minutes. Mr. Luke some years ago published a description of ligaturing nævi by carrying a single thread having several needles strung upon it across the tumour, then cutting off the needles, and tying the knots. In the following case Mr. Erichsen only used one needle and a double thread, a plan at once simple and successful of accomplishing the same objects.]

A child, two years old, was admitted, on the 23rd October, 1850, under the care of Mr. Erichsen, having a nævus on the right side of the forehead, about two inches long, three-fourths of an inch broad, and slightly elevated above the skin. Various but unsuccessful attempts having previously been made to destroy it with caustic, Mr. Erichsen proceeded to use the ligature, which he did in the following manner with complete success:—

A long triangular needle is threaded on the middle of a whipcord about three yards in length; one half of this is stained black with ink, the other half is left uncoloured. The needle is now entered through a fold of the sound skin, about a quarter of an inch from one end of the tumour, and transversely to the axis of the same. It is then carried through, until a double tail, nine inches in length, is left hanging from the point at which it entered; it is next carried across the base of the tumour, entering and passing out beyond its lateral limits, so as to leave

a series of double loops at least nine inches in length on each side. Every one of these loops should be made about three-quarters of an inch apart, including that space of the tumour, and the last loop should be brought out through a fold of healthy integuments beyond the tumour. In this way we have a series of double loops, one white and the other black, on each side. All the *white* loops should now be cut up on one side, and the *black* loops on the other, leaving hanging ends of thread of corresponding colours.

The tumour may now be strangulated by drawing down and knotting firmly each pair of white threads on one side, and each pair of black ones on the other. In this way the tumour is divided into segments, each of which is strangulated by a noose and a knot; by *black* nooses and *white* knots on one side, by *white* nooses and *black* knots on the other.

Mr. Erichsen thinks that this mode of applying the ligature will be found of service in all those cases of elongated flat nævi, in which, from the shape of the tumour, it is not possible to effect the strangulation by the ligature as ordinarily used, without inclosing an undue quantity of integument, and thus producing a larger cicatrix than is necessary for the eradication of the disease. The ordinary double ligature, or the the quadruple thread, as used and figured by the late Mr. Liston, always includes a circular mass, and hence is not applicable to those growths that are very much elongated or irregular in shape.

[The following is a good case of cellulo-venous nævus, taken from the notes of Mr. Ashton, and under the care of Mr. Erichsen.]

A child of about five years of age, came under Mr. Erichsen's care in February last, for a large tumour on the right nates. The parents state that shortly after birth some swelling was noticed about the right buttock, but it did not attract much attention until the child was about three years old, when it received a smart whipping from the grandmother in this region of the body. The tumour now increased slowly in size until it attained its present bulk. The integuments covering it also became mottled with purplish-red spots. No treatment of any consequence has been had recourse to for the removal of the growth.

On admission, a tumour as large as an orange is found on the nates of the right side, occupying the fold, and extending into the ischio-rectal fossa. It is very prominent, not distinctly circumscribed, and doughy throughout the greater part of its extent; but where it approaches the anus, it is of very firm consistence. The size of the tumour can be slightly diminished by steady pressure; but on the removal of the hand, its former bulk is speedily regained. It is not influenced by the child crying or struggling, and the skin covering it is mottled here and there with faint claret-coloured stains. There is no pulsation, bruit, or increased heat in the swelling.

Mr. Erichsen having diagnosed the tumour to be a cellulo-venous nævus, partially consolidated by inflammation, proceeded to remove it on the 6th of March.

Ice having been applied before the operation, with the view of lessening the vascularity of the tumour, Mr. Erichsen made a crucial incision

through the integuments covering it, and reflected these to the base of the tumour, exposing a large mass, apparently composed of much-dilated and tortuous veins and cellular tissue, with a few cysts containing brownish fluid. Nævus needles were pushed across the base of this, and it was strangulated with strong whipcord.

In a few days the tumour included in the ligatures sloughed away, leaving a deep hollow from which it had been removed. The surface of this cavity and the contiguous flaps now took on a peculiar unhealthy action; instead of granulations, large greyish-white masses, looking like melted fat more than anything else, were thrown up; the flaps became swollen and œdematous, and it was feared that a malignant degeneration was taking place.

The child's general health was carefully looked to, and potassa fusa freely applied. On the separation of the sloughs produced by the use of this caustic, the same morbid condition was, however, set up again; and as the parts in the vicinity became extremely irritable, it was thought advisable not to re-apply it.

Various local applications of an emollient or specific character were now used, but none could be borne; indeed, water-dressing appeared to be the only application that did not irritate.

The surface of the ulcer gradually assumed a healthier appearance; the flaps became less swollen; they lost the peculiar semi-transparent appearance which they had before presented, and the parts around evinced less irritability. But yet, every now and then, a tendency to a return of the former morbid appearance presented itself. This, however, gradually passed away. By the middle of May, about two months after admission, the child left the hospital, with the wound soundly and completely cicatrized, and with no appearance of disease about it.—*Lancet, July* 12, 1851, *p.* 32.

85.—CASES OF HEMORRHAGIC DIATHESIS.

By Alfred Poland, Esq., Assistant Surgeon to Guy's Hospital.

John R——, æt. 19 months; was admitted in December, 1849, with hemorrhage from the frænum of the upper lip. The child was exceedingly delicate, waxy, pale, and exsanguineous; and had received a blow on the lip the previous week, which was attended with great loss of blood. Caustic was freely applied, which effectually checked it for two days, when bleeding occurred, and was again stopped for another day. However, hemorrhage ensued a third time; and continued off and on up to the time of admission. Various remedies were now tried, but to no effect, until the pure nitric acid was freely inserted into the wound, which effectually answered the purpose. About six months afterwards the child was again brought to the hospital in a similar plight. There had been no recurrence of bleeding until two days before, when it broke out afresh, and resisted all efforts to arrest it. Remedies, consisting of alum, matico, nitrate of silver, &c., &c., were tried for three hours, when nitric acid was applied, and succeeded, as it had previously done.

[James R——, brother to the above, æt. 6½ years: whilst looking out of the window and drawing in his head suddenly, bit his tongue, which bled profusely. This continued until three o'clock next day, and remained uncontrolled in spite of the repeated application of the nitrate of silver.]

Several astringents were tried, as also nitric acid, which failed; the under surface of a matico leaf was then applied to the wound, and an infusion of matico given internally. This did not succeed; and about eleven o'clock, p.m., Mr. Poland applied the actual cautery, which stopped the hemorrhage. On the following day the child's body and extremities were found to be covered with large patches of purpura, looking like bruises after injury. He was ordered meat and vegetables, lemon juice to drink, and ten grains of chlorate of potash in water three times a day. Under this treatment, persevered in for three weeks, the boy perfectly recovered.—*Guy's Hospital Reports, Vol.* 7, 1851, *p.* 329.

ALIMENTARY CANAL.

86.—ON RESTORATION OF THE UPPER LIP.

By R. J. Mackenzie, Esq , Junior Ordinary Surgeon to the Royal Infirmary, Edinburgh.

[From the comparative rarity of disease of the upper lip requiring extirpation, and consequent removal of parts, little attention has hitherto been bestowed upon attempts to restore the lost parts in this situation.]

Blasius, Dieffenbach, and others, have successfully restored the lost upper lip by flaps, cut in different ways, from the cheeks; and in cases, where the upper lip alone has been destroyed, it will not require much ingenuity on the part of the surgeon to effect the restoration in one of these ways.

In cases of hare-lip in which the cleft was unusually wide, so as to amount nearly to absence of the upper lip, the edges of the wide cleft have been allowed to be brought into apposition by cutting through the whole thickness of the cheek, in a line curved upwards from each angle of the mouth. I have resorted to this proceeding, and have more than once seen it successfully practised by others, in cases of deficiency of the greater part of the lip, when the soft parts in the situation of the cheek were in a sound condition.

These modes of operation are suited for cases where the upper lip *alone* is deficient, and in which the cheek has not been involved in the injury or disease by which the parts have been destroyed. One of the most common causes, however, of destruction of the soft parts of the face is *cancrum oris*, as well as the mortification which occasionally attacks these parts during fever and the eruptive diseases of children, and in such cases the cheek seems rarely to escape the ravages of the diseases.

Two such cases have lately presented themselves in the hospital, in both of which, from the destruction of the cheek which had taken place,

it was impossible for me to restore the lost parts by any method, as far as I know, hitherto practised; and it is to the plan which I have adopted in these cases that I am anxious to direct attention. It has proved in the following case successful in removing the extreme deformity which existed, and promises, I think, in similar cases, to answer the purpose in view satisfactorily.

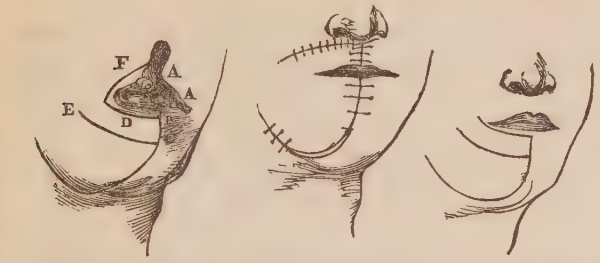
The subject of the first operation was a girl, of eighteen years of age, who, when between two and three years of age, lost her entire nose, nearly the whole of the upper lip, and the greater part of the right cheek, from mortification, the sequela of an attack of fever. She subsequently grew up a strong and healthy girl, and was in the enjoyment of excellent health when she entered the hospital (12th March, 1851) with the determination to submit to anything which could be done for the removal of her excessive deformity.

The sketch gives a good representation of the appearance of her face. The hard palate was widely cleft from exfoliation of the superior maxillary bones, which had taken place in nearly the whole extent of the roof of the mouth. Her articulation was very indistinct, and, as she spoke, her tongue protruded through the opening of the alveolar arch. The remains of the right cheek were drawn in by a thin cicatrix, which adhered to the superior maxillary bone above the angle of the mouth. The integuments of the brow were ample, and in excellent condition for the formation of a new nose; and the only difficulty lay in the restoration of the lip, which evidently could not be effected by incisions, however extensive, through the remains of the cheek.

The only plan by which it appeared to me the lost parts could be restored was, *the transposition of the lower lip to the situation of the upper*, whilst, at the same time, by extending the incisions under the base of the jaw, the integuments in that situation might be brought up to replace the lower lip, according to the plan recommended and successfully practised by Mr. Syme. The incisions required to effect this were pretty extensive; but it appeared to me that any measures, however severe, were warrantable, if they held out the prospect of at all effacing the hideous appearance which the girl presented, whilst she herself was most willing to submit to anything which was likely to effect this end.

The operation was performed (19th March) in the following manner:—After removing a slice from the free border of the remains of the upper lip on the left side (Fig. 1, A A), and freeing this part from its adhesions to the gum, I made a curved incision (E C) from about an inch

Fig. 1. Fig. 2. Fig. 3.



outside the angle of the mouth through the whole thickness of the lower lip to about its centre, and parallel with the border of the lip. A second incision (B C) was then made, at right angles with the termination of the first, and prolonged downwards under the base of the jaw, in the manner practised by Mr. Syme in the restoration of the lower lip. The *prolabium* of that part of the lip included in the excisions was then removed, and a cut surface (F) made in the natural situation of the base of the upper lip, by removing the cicatrix from the nostril to the right angle of the mouth. The two flaps formed by these incisions were then dissected fully back, and the bleeding vessels were secured by ligature. The upper flap was then raised and united (as shown in the diagram, A A, to B C, and D to F) in the situation of the upper lip, whilst the lower and larger flap was brought up and united to the cut surface of the lower lip and chin.

The right half of the lower lip was thus made to occupy the situation of the upper, whilst its place was supplied by the flap from beneath, and the right side of the mouth was now formed by the incision (E C) between the two flaps.

Fig. 2 explains the position of the parts when united in their new situation

The operation was tedious and embarassing from the unsteadiness of the patient, owing to the extreme difficulty of bringing her under the full influence of chloroform, -a difficulty which was experienced previously in removing two projecting teeth, and equally so afterwards in the operation for the restoration of the nose. She suffered from very little constitutional disturbance, however, and perfect union of the parts was obtained in the course of a few days.

A new difficulty, however, presented itself in the contraction of the mouth, which, in spite of all endeavours to prevent it, went on till the entire granulating surfaces of the two flaps had united. This contracted state of the mouth was afterwards obviated to a considerable extent by an incision, in which the integument and mucous membrane were divided at different levels. The mucous membrane was then everted and united to the skin, so as to form a *prolabium* for the upper lip,

whilst the skin was similarly inverted and united to the mucous membrane of the lower lip. The mouth was thus enlarged; but a small portion of the lower lip was unfortunately lost by sloughing, which has left a slight permanent deficiency at the lower part of the angle of the mouth.

About ten weeks after the first operation, when the parts were firmly cicatrised in their new situation, the nose was restored by bringing a flap from the brow. The operation was performed in the usual way, with the exception of the *columna* being taken from the scalp, according to the Indian method. This was done as it was thought better not to interfere further with the new lip, which would have been considerably diminished in size by raising a *columna* from its centre.

About a month after the formation of the nose, the collateral circulation of the new organ being well established, I divided the twisted neck of the flap, and attached it in the usual way.

The sketches show the result of these operations. The front face is from a daguerreotype, which, with a sketch of the profile, was taken five months after the formation of the lip, and three months after the restoration of the nose. The nose appears large,—a fault which, I need scarcely add, is unlikely to be permanent.

The chief difficulty met with in the progress of the case arose, as I have observed, from the obstinate contraction of the mouth; and the error committed in the operation, which gave rise to this difficulty, consisted evidently in the removal of the *prolabium*. This inconvenience, I have since found, may be avoided by preserving the *prolabium* of the lower lip in its situation, and uniting it to the flap brought up from over the base of the jaw.

The lines in Fig. 3 will serve to explain the situation of the incisions by which this object is attained; and if the method of operation I have described is thought worthy of performance, this modification of it (the preservation of the *prolabium in situ*) will be found of the greatest advantage in obviating the contracted state of the mouth.

The second case, in which a somewhat similar operation has been performed, was that of a girl, of eight years of age, who, when two years old, suffered in a similar way to the preceding case, from mortification

of the face during fever. The same parts were destroyed as in the case I have related; but the left half of the upper lip had retained its vitality. The whole of the soft parts, however, between the eye and the lower lip had been lost, a small portion of the lower eyelid at the outer angle only remaining. From the contraction during cicatrisation, the remains of the angle of the mouth had been drawn upwards close to the eye. The nose, too, had been entirely destroyed. In this case I attempted to restore the lost parts by bringing up a large flap, consisting of the lower lip (saving the *prolabium*, as in Fig. 3), and integuments over the base of the jaw, so as to fill up the whole gap at once; but the result of the operation was unsuccessful, from an unforeseen accident. From the effects of the chloroform, which had been administered pretty freely during the time of the operation, the poor child vomited, with little cessation, for thirty-six hours. From the long-continued drag thus made on the sutures, union failed in the entire extent of the wound, and the flap, in spite of all means used to keep the edges together, gradually retracted and receded from the surface to which it had been attached. By a second operation, however, the flap was united to the remains of the upper lip. The upper lip has thus been completely replaced, and, from the preservation of the *prolabium* (as shown in Fig. 3), the natural size, position, and appearance of the mouth has been entirely restored.

The restoration of the eyelid and a small part of the cheek, which are still deficient, may in this case be accomplished without much difficulty; whilst no obstacle exists to the formation of a new nose by a future operation.—*Monthly Journal of Med. Science, October*, 1851, *p.* 348.

87.—INSTRUMENT FOR APPLYING ELECTRIC HEAT IN DENTAL OPERATIONS.

By George Waite, Esq., M.R.C.S., Surgeon-Dentist.

[The importance of the employment of electric heat was first suggested to Mr. Waite by the late Mr. Murphy, of King's College. On this suggestion he determined to apply it to destroy the pulp of decayed teeth. Mr. Waite was then persuaded to take out a patent for it, and sent a drawing of his invention to the 'Illustrated Catalogue of the Great Exhibition.' He describes it as follows:]

I use (he says) a Groves's battery with eight cells. When using it I have in my hand a holder with two copper wires passing through it, one positive from the battery, and the other terminating in a groove in the holder and fastened to a spring, by which I make or break contact at will with the negative wire. To the further end of the two wires a thin platinum wire is connected, and on the battery being charged and contact made, this takes suddenly the electric heat.

The efficacy and simplicity of the process being so decided, I am enabled to use it for many purposes, viz., to evaporate quicksilver from cements, and render them much less injurious to teeth than they otherwise would be; also where too great sensitiveness exists, and which prevents the operator from removing the caries; where gums have receded and left the necks of teeth highly sensitive to the touch; where teeth are

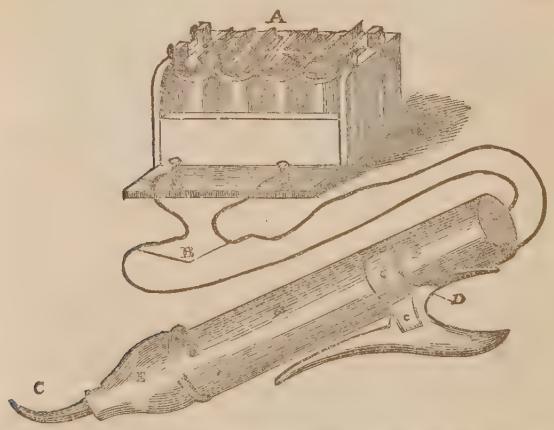
affected by mollities which cannot by other means be combated; where teeth have to be pivoted, and when vitality remaining in the root would subject the patient to serious inflammation; where teeth have been broken, or cut, or filed, and left sensitive to cold and warmth; where violent toothache exists; where hemorrhages come on, or slight bleeding into the cavity, preventing a continuance of any operation.

The electric heat retains its force differently to all other heat which can be applied to the mouth; the platinum wire can be placed, without the patient being aware of it, near the part affected, heat can be produced almost momentarily, and suddenly deadened, and as a most interesting phenomenon, and one which has surprised me very much, in patients of a highly nervous temperament where I have expected much suffering, none has been endured on its application. It would be superfluous here to detail many interesting facts which the use of electric heat will discover to the scientific dentist; these philosophy explains with the laws of the sensitive faculty. It is my sincere hope that operators will be judicious in the use of this agent, and not bring it into disrepute by ill-judged and ill-timed applications.

In many cases it will be found equally efficacious when holding it near the teeth, as if they were touched by it.

Care must be taken not to continue its application too long, as it will burn up and blacken the part it touches.

As time passes on, I look forward to its use being generally understood, and it will then give rise to many improvements tending to the benefit of society.—*Lancet, June* 28, 1851, *p.* 703.



This plate represents the electro dental apparatus ready for use. A. Groves's battery; *a*, an ivory-holder pierced with two grooves, one of them open at the end; B, the copper wires, one terminating at *b;* C, the platinum point; D, a spring to make contact with the wire which terminates at *b;* E, a mouth-piece unscrewing at F, and in which the platinum and copper wires are connected.

88.—ON THE DESTRUCTION OF THE DENTAL PULP, &c. BY THE HEAT OF ELECTRICITY.

[Acting upon Mr. Marshall's suggestion, Mr. Thomas H. Harding, of London, in a letter to the editor of the 'Medical Times,' describes the following simple apparatus whereby this purpose is effected by means of platinum wire. He says:]

The apparatus, as ultimately employed by me, may be thus described. The battery, which of course may vary according to the choice of the operator, but which it is so desirable to render as elegant and simple in arrangement as possible, is constructed on a plan similar to that of the large battery now employed by Mr. Marshall, which I believe he shortly intends to describe. It consists of only two pairs of plates contained in a single cell, and is set in action by one fluid, viz., dilute sulphuric acid. The terminal six inches of the poles, which are of copper wire plated, are supported on an ebony or ivory handle, upon the side of which one of these poles is interrupted at a particular point. The extremities of the poles are connected by a piece of platinum wire 1-109 of an inch thick and $\frac{3}{4}$ of an inch long, which is bent into a loop. The sides of this loop are then brought parallel, and nearly close to each other, without touching, and it is thus introduced into the pulp-cavity of the tooth to be operated on.

By a slight pressure on one side of the ebony handle, the interrupted pole is temporarily joined, and the platinum wire immediately becomes brilliantly heated, as it lies in contact with the tooth-pulp. Sometimes, however, I have found it desirable, in the first place, to complete the galvanic circuit and thus heat the platinum wire before bringing it to bear on the exposed pulp. The flexibility of the loop of wire enables the operator to bend it in any direction previously to use. In this way I have succeeded in rapidly destroying the pulp of decayed and condemned teeth, and have proceeded, after a few minutes, to the operation of filling with gold or with Ash's metallic paste. I have also destroyed, with the greatest ease and rapidity, the pulps of incisor teeth, cut off for the purpose of being pivoted.

It is obvious that this method is applicable either for the simple cure of tooth-ache, or as a preliminary step to the operation of filling. I am aware that there is nothing novel in the use of the hot wire for destroying the nerve of an aching tooth. The old village doctress has long ago cured tooth-ache by the thrust of a hot needle or pin; and dentists occasionally use a heated wire. But the difficulty has been felt of applying the wire easily, and at a duly elevated temperature. In the method just described, this is surely, readily, and instantaneously accomplished. The vitality of the tooth-pulp is thoroughly destroyed, and it is even so far consumed or carbonised, that the operations of filling or pivoting may be at once proceeded with, instead of having to be delayed. Owing to the extreme fineness of the wire employed, the local heat, though intense, is very limited in its action, and, with due care, the tooth-substance need not suffer any appreciable injury. It may also be remarked, that in operating on some teeth, I have found, by completing the galvanic circuit on approaching the teeth, that the light given out by the incan-

descent wire, aids, very remarkably, in giving a perfect view of the exact point at which the tooth-pulp is exposed.

In conclusion, I can only say, I beg confidently to lay this method before the notice of the Profession, as the most ingenious and simple contrivance yet invented for the object in view, and as one which, I think, will be very generally adopted. It will give me great pleasure to exhibit the apparatus and mode of operating to those who are interested about it; and I may add, that the apparatus itself will be constructed by Mr. Coxeter, of Grafton-street, East.—*Med. Times, June* 28, 1851, *p.* 702.

[At a meeting of the Royal Medical and Chirurgical Society,]

Mr. Marshall narrated a case of fistulous perforation of the right cheek, in a strumous man, twenty-five years old. A fine platinum wire, 1-50th of an inch thick, was passed through the fistula, so that its ends could be connected with the poles of a Groves's battery, consisting of four cells, each having a platinum surface of thirty-two square inches, and a zinc surface of thirty-eight square inches. The galvanic current was kept up for nine seconds; but little pain was felt from the action of the heated wire; sloughs appeared at both orifices of the fistula; that on the inner orifice came away on the fifth day after the operation; the outer one was separated on the sixth day. On the eighth day, the inner opening was closed; on the eleventh, the outer opening was also closed. A smaller sinus was discovered some days afterwards on the inner surface of the cheek; and by a repetition of the operation, was also cured within a fortnight. Mr. Marshall had employed the *electric cautery* in rectal fistulæ and in internal and external hæmorrhoids, with success. He anticipates that its employment will occasionally be found more advantageous than the knife, scissors, or ligature.—*London Journal of Medicine, July*, 1851, *p.* 670.

[Mr. Leachman recommends for this purpose an electro-magnetic coil, as used by Mr. Faraday. He says,]

The use of a large battery is attended with much inconvenience and expense. In lieu thereof, I would recommend the employment of an electro-magnetic coil. It was found by Mr. Faraday, ('Experimental Researches in Electricity,') that on connecting the ends of a stout insulated copper wire, 100 yards in legth—wound on a hollow reel, into the interior of which a piece of soft iron was inserted, to form an electro-magnet -with the poles of a small battery, consisting only of a single pair of zinc and copper plates, excited with dilute acid, the intensity of the electricity induced in the coil on breaking connexion with the battery was sufficient to fuse a piece of platinum wire one-hundredth of an inch in diameter and half an inch in length, interposed in the circuit. By lessening, however, the power of the battery, either by diluting the acid or exposing a smaller surface of metal to its influence, the intensity of the electricity induced in the coil might be so adjusted as to heat the platinum wire to the required temperature only. One of Mr. Smee's half-pint cells would, I think, be found to afford ample power. The apparatus of Mr. Waite, a description of which, with a diagram, is given in your journal, would with this arrangement be equally applicable and advantageous.—*Lancet, July* 5, 1851, *p.* 24.

89.—ON OBSTRUCTION OF THE INTESTINE WITHIN THE ABDOMEN.

By R. R. Robinson, Esq., late President of the South London Medical Society, and formerly Surgeon to the London Dispensary.

[Speaking of the causes producing the obstruction, Mr. Robinson states that, although contraction of the bowel and the formation of bands, &c., are the *real* causes of obstruction, yet they are not the sole cause; for these are, for the most part, sudden and violent exercise, and errors in the quantity or quality of the food. As to the diagnosis, it is not easy to state the exact nature in the early stages. It may be confounded with colic, enteritis, stricture, malignant disease, and introsusception. Internal strangulation resembles at first colic; but afterwards the pain becomes more violent and constant, with vomiting, ultimately stercoraceous. From enteritis, the diagnosis is comparatively easy; and as stricture is generally confined to the rectum, an examination will easily clear the case. From malignant disease, the countenance, and the rapidity of its course, and more persevering constipation, would distinguish it; but from introsusception, no symptoms can clearly and unerringly detect it.]

Diagnosis.—Respecting the mode of distinguishing one kind of obstruction from another, great difficulty must, necessarily, be felt. If I may draw any inference from one case (and I am very unwilling to do so), I should say that the free relief of the bowels, the result being nevertheless fatal, would serve to distinguish obstruction, the effect of contraction of the peritoneal coat of the bowel, from strangulation, resulting either from the twisting of the mesentery, or the formation of false bands. According to Mr. Mackenzie, the following will serve to diagnose dislocation of the sigmoid flexure of the colon: "In these cases, while all the symptoms of strangulation and obstruction of the bowels are present, there is one symptom never absent, which, respect being had to the history of the case, leads to a correct diagnosis, viz.—that it is impossible to throw up injection, per rectum, in any quantity; for, as soon as the gut is filled up as far as the twist, which is always low down, the fluid injected flows out as fast as it is thrown up, independent of any action of the intestine itself. Besides, the introduction of the long tube is impracticable, being always arrested at the obstruction."

Dr. Barlow, in an interesting paper in Guy's Hospital Reports, endeavours to diagnose the *situation* of stricture of the alimentary canal, by the *amount* of the secretion of urine, and cites cases in point. "It seems," he says, "that where there existed a perfect obstruction in the upper part of the small intestines, there was almost a total suppression of urine; where there was a diminution of the calibre of the canal, in the same situation, the urine was diminished in quantity; and where the small intestines were free, and the obstruction was seated in the colon, the urine was very abundant." Should future experience confirm these statements, a very valuable diagnostic mark will be obtained; but in Dr. G. Bird's case, and in some of those which I have related, the obstruction was seated in the ileum, and yet there was no perceptible diminution

of urine, so that more facts are wanted to establish this point. At present it seems probable that where the *duodenum* is the intestine affected, non-secretion of urine will be noticed.

Treatment.—In the treatment of this dangerous malady, the following indications present themselves:—1, to open the bowels; 2, to subdue inflammatory action; 3, to support the strength; and, 4, to remove the obstruction.

1. *To open the Bowels.*—As constipation is one of the most constant, and, at the same time, earliest symptoms, to relieve the bowels is certainly the first indication; and this may be attempted by,—*a*, purgatives; *b*, injections; *c*, the warm bath; *d*, nauseating remedies; and *e*, bleeding.

a. Purgatives.—Great judgment is, I think, required in the selection of purgatives, as, if they do not effect their object, they do much mischief; for it is questionable whether the ulceration met with in the mucous membrane, in many cases, may not be in part owing to the unsuccessful use of drastic and violent purgatives. Had I grounds for suspecting that a case was one of intestinal obstruction, from any of the causes mentioned, I would endeavour to liquefy the motions, so that, if possible, they might pass the stricture in a fluid form. For this purpose, I would give one large dose of calomel, to be succeeded every two hours, if the stomach would permit it, by drachm doses of sulphate of magnesia, in peppermint water; and, did these not succeed, I would rub croton oil on to the abdomen, or try one drop of croton oil internally. Should these fail, I would give up the use of purgatives, feeling assured that the obstruction was much too complete to be overcome by their means.

b. Injections.—Purgatives failing to procure action from the bowels, recourse is naturally had to injections, which should, in the first instance, consist of the compound extract of colocynth, dissolved in water; but when a tympanitic state of the bowels occurs, turpentine, or the tincture of assafœtida, is to be preferred. So far, however, as my experience goes in these cases, injections avail but little; and I shall hereafter relate a case where seventy-two injections were administered without any apparent beneficial result.

c. The Warm Bath is a remedy which it would be very proper to use in the earlier stages; but, as the disease advanced, the strength of the patient being much exhausted, would scarcely justify its trial. Fomentations, often useful, and always soothing, should be used in all cases, especially where there is pain.

d. Nauseating remedies, in a strong and robust individual, might deserve a trial. Of these, perhaps, the two best are tartarized antimony, and the tobacco injection; but I should not be very sanguine of obtaining success by their means.

e. Bleeding may be now and then resorted to, in the earlier stages, in the robust and plethoric; but bleeding, carried to any great extent, I consider objectionable, for reasons to be stated hereafter.

2. *To remove inflammation* is a point to which particular attention should be directed; and, perhaps, there is but one thing of more consequence than this, for if it be allowed to go on unchecked, it may destroy

the patient; and yet, if too vigorously attacked (by reference to the cases it will be seen that, in some, it was entirely absent, and, in almost all, limited, and by no means severe), the patient may sink from other causes. I think, therefore, that general bleeding will seldom be called for on this account; the application of leeches, fomentations, and the administration of small doses of calomel and opium, will be all that is required for removing or controlling peritonitis brought about by this cause.

3. *To support the strength.*—I am very anxious to lay great stress upon this point, because I do not think it has been sufficiently attended to in practice; and I feel sure that patients have been largely bled, who would have had a better chance, had the vital fluid been less unceremoniously abstracted. If the bleeding be not sufficient to effect its object, either in opening the bowels by its depressing effect, or by removing the peritonitis by its antiphlogistic power, it must, if carried to a great extent, do infinite harm, as it will tend to depress the vital powers, already at a low ebb, and thus take away, I may say, every chance, either from the efforts of nature, or the resources of art. In the absence of fever, and where the stomach would allow of it, I would give, from time to time, barley water and chicken broth in small quantities. Where there is great restlessness and want of sleep, and where I had failed in the use of purgatives, and determined no longer to administer them, I would certainly advise the administration of opium, as, by so doing, I should hope to tranquillise the nervous system; for nothing tends to exhaust the frame so much as long-continued nervous irritability; and cases are on record showing the good that has been done with it occasionally. If I employed opiates, I should prefer solid opium to every other form,—first, as being more likely to be retained by the stomach; and secondly, as possessing a stimulating as well as sedative property, which, I think, would, in these cases, be decidedly advantageous.

4. *To remove the obstruction* is one of the most important and difficult questions connected with this subject, and one upon which much difference of opinion exists. It is clear that this can only be done with certainty by means of an operation; and two cases have lately occurred, in which encouragement has been given to this plan. In one of the cases (Mr. Hilton's) the bowel was so far liberated, that the intestinal contents passed through the obstructed part. In neither of the cases, however, did the patient long survive. In considering this subject, four points are to be entertained: A. the likelihood of finding and removing the obstruction; B, the place of performing the operation; C, the time at which it should be undertaken; D, the chance of success that may attend the attempt.

A. *The likelihood of finding and removing the obstruction.* Upon this point, there can be no doubt that there is great uncertainty; for although, in both the cases to which I have alluded, the obstruction *was* detected and removed, yet in one (Mr. Hilton's case) very considerable difficulty was experienced: and in case 16, had an operation been undertaken, the incision would, in all probability, have been made to the *right* of the umbilicus, as a decided induration was evident there,

and not elsewhere, and a pouch immediately above it. It was natural, therefore, to suppose that this was the point of obstruction: whereas, on dissection, this proved to be merely hardened scybala; and the fatal incarceration was situated in the upper and posterior part of the *left* side of the pelvis.

B. *The place of performing the operation.* Mr. Phillips says: "There are some cases where the seat of obstruction is so clearly indicated, that *no doubt* remains. In such cases, I apprehend the rule is evident, —the incision should be made as near as is prudent to that point. But supposing the point of obstruction to be only obscurely marked, or indeed not discoverable at all, then I consider the incision should be made on the median line, because an opening in that situation may be found most convenient for liberation, if that be practicable; or, for the establishment of an artificial anus, supposing liberation of the intestine be not accomplished." The case, however, to which I have just alluded, induces me to think the central incision, as recommended by Dr. Crisp, preferable in all cases where the obstruction is seated in the small intestines.

C. *The time at which an operation should be undertaken.* It is very difficult to lay down any decided rule for this. Mr. Phillips says, that interference by surgical operation is justifiable when three or four days have passed without any relief from the bowels by ordinary means, providing constipation be complete, and fæcal vomiting continue. I scarcely think we are justified in operating so soon; partly because persons have recovered from constipation of twenty-three days' continuance, and partly for reasons which will appear in the sequel.

D. *The chance of success* I regard as a very important consideration before undertaking any operation; and I cannot think that cases of internal intestinal obstruction, even under favourable circumstances, offer much chance of a successful issue from operation.

In the cases to which I have referred, it has been said, that, had an operation been performed earlier, a different result might have been obtained; and no doubt, in both cases, delay was caused by the unwillingness of parties interested to give their consent. Can it be a matter of wonder, when it is recollected, that if an operation be undertaken, both the patient and surgeon must be prepared to go *all* lengths? The obstruction may *not* be at the part suspected; it may be *some way* from where the operation was commenced, and a *very large abdominal section* may be required to complete the operation; and it may possibly not be completed at all. How can this be undertaken without very considerable risk? How can such an operation be *proposed early*? And how can any better justification be urged for such a proceeding, than that long since advanced by Celsus: "Satius est anceps remedium experiri quam nullum?"

If it be true, that great difficulty attends the finding these obstructions, and great danger follows the attempt at removing them by the knife, so that we cannot conscientiously recommend it but as a forlorn hope, it is but reasonable to inquire, whether any other expedient can be resorted to for a similar purpose. And this naturally induces me to ask whether nature ever produces a cure, or whether spontaneous relief

is ever obtained? Several cases are on record, where persons with the symptoms I have described, and, to all appearance, sinking from internal obstruction, were suddenly relieved in the bowels, and gradually recovered. A case is alluded to by Mr. Cooper where this happened. An elderly lady, residing at Norwich, was under the care of Mr. Colman, suffering from constipation of the bowels, having had no evacuation for four days. The usual purgative remedies were prescribed, but without effect; enemata and more drastic cathartics were tried, but still ineffectually; vomiting and immense distension of the abdomen supervened; the symptoms became more and more urgent, and, on the twelfth day from her attack, she had had no relief from her bowels. Dr. Alderson was then called in, and asked *what purgative* he would recommend; to which he replied—"None; but a large dose of opium." It was given, and *in a few hours* the bowels were freely opened, and the patient recovered. What was the precise condition of this lady must ever be open to doubt; but I venture to suggest that this might have been a case where the bowel was strictured by false membrane, that inflammation and ulceration of this band ensued, and that then the gut was liberated; and I am the more inclined to think so from what is observable in Fig. 5, in which the band seems to be undergoing the ulcerative process; and I feel convinced that, had the patient lived a little longer, it would have entirely given way, and the patient might possibly have recovered. It is this conviction which makes me lay so great stress upon keeping up the strength of the patient; for as newly-formed parts are less organized than those formed originally, there is a hope, if the strength of the constitution be kept up, that the band may give way before the bowel, and the patient's life be saved. It is from this case that I particularly recommend the renewal of the old plan of metallic mercury; I think its use has not been rightly understood. That it will remove an introsusception, or enable a portion of bowel to be drawn out of these bands, I agree with Mr. Hilton, is not at all likely to happen; but that it might in favourable cases (Mr. Hilton's was not one of that sort), by exciting a pressure upon the bowels, break through a false band, I verily believe; and I am more strengthened in this idea by the good that has occasionally followed its use. I have heard of a case, which I believe was of this kind, where metallic mercury appeared to remove a very obstinate constipation, and the patient recovered; and my friend Mr. Lawrence of Brighton, has mentioned to me, and kindly allowed me to make public, the two following instances, which are cases in point.

In one, a boy, æt. 10, was seized, without any apparent cause, with constipation of the bowels, but with no sign of inflammation. He was bled, leeched, took drastic purgatives, and had seventy-two glysters administered. On the twenty-first day of the disease, no motion having been procured, ℥iij of metallic mercury were swallowed; no effect following, the same quantity was repeated on the twenty-third day, after which he felt great weight and pain in the abdomen, and voided, with much forcing, an immense quantity of fæcal matter, and all the mercury, minus ℥ss; almost fatal syncope followed, but the boy eventually recovered. The other was a case of similar kind, of shorter duration; it occurred in an elderly lady. All purgatives proving unavailing, two doses of

metallic mercury, of ℥iv. each, were given; several motions (and all the mercury, minus ʒj) followed its exhibition after six hours, but the exhaustion and the depression occasioned were such as to destroy the patient. For these reasons, I think metallic mercury again worthy of a trial; it *can* do no great harm, and *may* do good. That it will often fail, I have not the least doubt, especially where the obstruction is low down, and has been so great as to ulcerate or destroy the coats of the bowel; but where, on the contrary, the band is thin, and high up in the canal, where the constriction is not so great as seriously to engorge or injure the part constricted, where the system does not sympathise much with the local malady, and where the powers of life remain vigorous, I am not without hope that it may *occasionally* succeed; and if *but one case* should occur in which, from what I have said, a trial of this remedy should again be made with success, I shall consider my observations not altogether out of place.

[The conclusions Mr. Robinson arrives at are:]

1. The ileum is that part of the intestinal canal where internal obstruction is most likely to occur.

2. Membranous bands (probably the result of former peritonitis) are the most frequent cause of obstruction.

3. Partial is more likely than general peritonitis to lead to obstruction.

4. All the convolutions of the intestines may be united together without obstruction.

5. Mechanical, although the direct, is not the sole cause of obstruction, as there is reason to suppose the mechanical cause has been in existence sometime before the symptoms show themselves; other causes must therefore arise to produce them, and the most frequent of these are sudden and violent exercise, and errors in the quantity or quality of food.

6. It is *possible* for a spontaneous cure to arise from inflammation and ulceration of an obstructing band.

7. The same consequences are seen in internal intestinal obstruction as are seen in other obstructed canals—viz. hypertrophy and dilatation above the stricture; atrophy and contraction below it.

8. The symptoms vary considerably in different cases.

9. The order in which the symptoms arise is as important as the symptoms themselves.

10. There are no symptoms by which one obstructing cause can be clearly distinguished from another.

11. The duration of the disease varies much in different cases.

12. The strength of the patient should be maintained.

13. Bleeding should be employed with great caution.

14. The seat of obstruction may be very apparent, and yet deceptive.

15. An operation is only justifiable as a forlorn hope.

16. As a rule, when an operation is resorted to, the central incision is to be preferred.

17. There is reason to believe that metallic mercury has proved useful; and it is in obstruction from membranous bands chiefly, if not solely, that benefit is to be expected from its use.—*London Journal of Medicine, July*, 1851, *p.* 593.

90.—*On the Treatment of Umbilical Hernia in the Adult, by the use of a New Apparatus devised by* M. Bourjeaurd. Under the care of Mr. Curling, in the London Hospital.—The apparatus is composed of a broad belt of vulcanized Indian-rubber, about twelve inches broad, in which the elastic webbing is, according to M. Bourjeaurd's method, disposed in distinct circular or spiral bands, about half an inch wide. These being sewn together, produce a gentle, continuous, and permanent pressure, and always afford an equal amount of support to the patient, whatever posture he may assume. This belt draws on with great ease, and adheres perfectly to the waist. In order to give some more support posteriorly, M. Bourjeaurd has adapted vertically two flexible and somewhat resisting bands running on either side of the spinal column, so as to take off a portion of weight from the anterior part of the abdomen, these bands yielding to any movement of the trunk backwards.

The most ingenious and useful portion of the apparatus is a pad filled with air, which is fixed to the internal aspect of the belt, exactly opposite the umbilical protrusion. The air-pad is shaped for each individual case, according to the size of the ring, upon the circumference of which it exercises a gentle and constant pressure. The pad being sufficiently yielding, a portion of it insinuates itself into the ring, while the remaining part of it presses, without undue force, on the surrounding skin and muscular structures; and the vitality of the latter is thereby not destroyed, as happens under the pressure of hard bodies. The great desideratum was to afford the patient wearing this belt the faculty of increasing or diminishing the pressure at the various periods of the day, when such changes are necessary. This is effected by means of a semi-elastic strap, fixed on the external portion of the belt, and running round the latter exactly over the air-pad. Thus, by tightening or loosening this strap, the patient may regulate the pressure as he pleases.

It is plain that breathing or coughing will be accompanied by no uneasiness with this belt, as the sac, in any violent effort, does not come into contact with any hard substance, as, for instance, ivory, but with a yielding though sufficiently resisting surface. This belt seems, then, to combine great advantages, and to be superior to the steel springs in general use; for it seems to act in a more uniform and extended manner than the spring which presses on two points only.

That the faculty of moving the body in various directions was appreciated long ago, is evidenced by the improvement introduced by the late Mr. Hey, of Leeds. It is well known that his instrument is composed of two semi-circular springs, the front end being fastened by a brass vertical hinge to a small plate of thin steel, which supports the pad. The pressure of the spring keeps the pad closely applied to the umbilical region, while the hinges which unite them to the steel plate impart all the flexibility which is necessary for accommodation to the various motions and attitudes of the body. It appears to us that the elastic belt and air-pad will attain that end in a much more easy and certain manner. Ivory hemispheres, either retained by springs or straps of adhesive plaster, as recommended by Sir A. Cooper, must act too powerfully, and be very troublesome with children; nor can a radical cure be easily obtained, as the vitality of the part is too harshly interfered with;

but it has been stated to us that the continuous gentle pressure of the air-pad and elastic belt has, in several instances, brought about, in young subjects, a permanent occlusion of the abnormal umbilical apertures.—*Lancet, July* 12, 1851, *p.* 33.

91.—*Effects of Morphine in Hernia.*—By EDWARD W. DOMAN, Esq., Essex.—[Mr. Doman relates a case in which a labourer, a native of Suffolk, aged 32, had been the subject of left inguinal hernia for five years. It had frequently come down, but always returned on assuming the recumbent posture. On the 18th, he was attacked with severe purgings; and on the 19th, the hernia descended, but was soon returned; but in the afternoon it again descended, and could not be returned. On the 20th, he was taken home, and at five p.m., Mr. Dowman was sent for. He found a direct inguinal hernia of the left side, of considerable size, and filling the scrotum of that side; tense and painful; he had vomited several times, and complained of much pain below the umbilicus. As he was considerably prostrated, he was not bled, but placed in a warm bath, and the taxis applied. Mr. Dowman continues:]

After persevering with the taxis for some time, without avail, I had him put to bed, and gave him half a grain of muriate of morphine every hour, until he had taken one grain and a half. He was soon considerably narcotized; vomiting had ceased, and pain moderated. I again tried the taxis, without effect. Thinking he would become still more under the influence of morphine, I left him for a short time. The taxis was again tried, but had no effect.

About eight a.m. of the 21st, he had recovered from the effects of morphine; the hernia as tense and as large as at first, and having been in that state upwards of thirty-six hours, I told him that I thought it would be necessary to operate, but I would first try a warm bath and bleeding. I bled him in the bath, *ad deliquium*, and attempted reduction, but failed; he was now put into bed, where he became sick, very faint, and covered with profuse perspiration. I again tried to reduce it, but without any effect on the hernia. On his recovering from syncope, I told him it would not be safe to delay operating any longer. It was now ten a.m. He positively refused to allow the operation. He was again in great pain, particularly on handling. I thought if I brought him more completely under the influence of morphine, there might be a chance; and as he still refused to be operated on, I began giving him half-grains of morphine every hour, until he had taken two grains and a half. About three p.m. he was quite narcotized, and on examining the scrotum I found it more flaccid; and on using the taxis, the hernia in a few moments passed up easily; he was immediately relieved, after having been forty-eight hours in suffering. He slept quietly that night, kept himself quiet all the Friday, his bowels acting that day without medicine; and after fitting himself with a truss (which he had never yet worn), he returned to his work on Monday, the 25th.

In the 'Monthly Journal of Medical Science,' for 1841-2, formerly

edited by Dr. Cormack, several cases are given of hernia having been reduced through the influence of opium; and one (Number for July, 1842, page 591), where three grains of solid opium and four and a half grains of morphine were given in the course of a few hours, before reduction could be effected. I have myself, whilst residing in the West Indies, seen several cases reduced by means of opium, and this is the third case that has occurred to me in this village within three years, where morphine has been effectual in hernia, twice in one individual. In the case of J. S., the hernia had been strangulated twenty-four hours before any medical man saw him. Had bleeding any effect in rendering morphine more effectual the second day? Perhaps it had. I should in future, particularly in young and able subjects, always have recourse to bleeding before using morphine.—*Lancet, September* 13, 1851, *p.* 249.

92.—*On a New and Simple Method for the Cure of Fistula.*—By H. B. Evans, Esq., London.—[The frequently unfortunate and unsatisfactory results of the operation for the cure of fistula in ano, suggested the following plan to Mr. Evans:]

In October, 1850, W. E——, box-maker, aged 42, applied to me with an abscess in the neighbourhood of the rectum, pointing externally, which was opened, and gave exit to a large quantity of pus. This gradually degenerated into a deep fistulous tract along the rectum, and communicating with it at its extremity. For two months the usual remedies were adopted without success, and I then expressed my opinion that an operation must be resorted to. In this I was fully borne out by the opinion of an eminent hospital surgeon whom I called in. This the patient obstinately refused to submit to, and such refusal led to my adopting the mode of treatment I am about to detail.

A blunt-pointed silver probe, five inches in length, (the sinus itself being four inches in depth,) was inserted into the wound, having previously being dipped in dilute nitric acid, (one part of acid to one part of water,) and suffered to remain there a minute. That this had a strong cauterizing effect, I knew from the pain it occasioned. Thus far the result was desirable; but in consequence of the destruction of the silver probes by the acid, and the impossibility of using them more than three or four times, I had some copper ones made, and used them in the same manner, only thus substituting a nitrate of copper for a nitrate of silver, and I think with a better effect. Under this treatment I was pleased to see the depth of the sinus daily decrease by the gradual filling of it up with healthy granulations from the bottom. This was continued nearly every day for two months, February 22nd, 1851, being the last occasion on which I thought it necessary to apply the nitrate of copper. The patient is at the present time perfectly sound.

In March, 1851, W. H.——, aged 30, applied to me with strumous disease of the testicle. Iodine and iron were given, which arrested the progress of the disease, and produced a corresponding improvement in his health. The outward form of the testicle was retained, but with an

open sinus of an inch and a half in length in an oblique direction from the apex, and discharging a thin, white, glairy fluid, peculiar to fistulæ. The same treatment was pursued as in the former case, the sinus becoming entirely filled up, and the patient discharged at the commencement of the present month (September), without any external marks of previous disease, beyond a slight irregularity on the surface and a small cicatrix.

Thus by an easy method may the most strumous fistulæ be traced to their extremities, and a strong caustic power applied to the bottom of the wound, from whence it is so desirable granulations should arise.

A limited sphere of private practice enables me only to give these two cases; but I have no hesitation in saying, that if this system be approved of and practised by surgeons generally, they would have as much reason to be satisfied with it as myself and patients, and the use of the knife would become almost obsolete. When a silver and copper wire are introduced together, after having been dipped in the acid, the caustic effect is intense, (likened by the patient to a red-hot wire,) and if allowed to remain too long, would destroy the tissues with which they were in contact. This, I apprehend, is the effect of the galvanic action set up by the contact of the copper and silver wire with the acid acting upon them.

Before concluding, I will just observe that the treatment in the first case was put into practice some time before the report of the treatment of 'Fistula and Hæmorrhoids by Platinum Wire made red-hot by Galvanic Battery, by Mr. Marshall, of University College Hospital,' published in 'The Lancet' of May 17th, 1851.—*Lancet, October* 11, 1851, *p.* 343.

93.—ON FISTULA IN ANO.

By T. B. Curling, Esq., F.R.S., Surgeon to the London Hospital, &c.

[Mr. Curling makes the followining interesting remarks on the utility of the ligature in the treatment of fistula in ano.]

When the opening in the rectum is more than an inch and a half above the external sphincter, the division cannot be made without risk of hemorrhage, which the surgeon may find great difficulty in arresting —indeed, death from bleeding has happened after the division of a rectal fistula high up. These cases are best treated by a ligature, which if properly applied and very gradually tightened, answers very well, and is less tedious and painful than is commonly supposed. The application of the ligature to fistula, though often practised formerly, is now seldom resorted to, the knife being found a less painful and tedious means of curing the disease. Some years ago, my colleague at the London Hospital, Mr. Luke, devised an ingenious screw tourniquet for gradually increasing the tension of the ligature, by which an improvement is effected in this mode of treatment. A strong cord of dentist's silk having been carried through the fistula by the introduction of an eyed probe with a moveable extremity, and withdrawn at the anus by means of a spring

catch passed into the rectum upon the fore-finger of the operator, is to be attached to the screw apparatus, and secured with moderate tightness, but not so as to cause pain. The tension of the ligature is afterwards to be very gradually increased by turning the screw as it gets loose, until the cord cuts its way out. While this process of ulceration is proceeding, the gap behind becomes filled up by granulations; so that, in a day or two after the removal of the ligature, the fistula is found to be cured. Though the treatment by ligature in this way is safe and nearly free from pain, and admits of the patient moving about, the application of it gives more trouble than division of the parts by the knife; and owing to the necessity for turning the screw at intervals, more attention is required afterwards. On these grounds, incision is preferable in ordinary cases, and, I may add, is so regarded by Mr. Luke; but, in cases of fistula opening so high up in the rectum that the knife cannot be used without danger of hemorrhage, I should certainly employ the ligature. Such cases, I know, are not common in practice, but they do occasionally occur. I witnessed the treatment by ligature of two of Mr. Luke's cases, in one of which the internal opening of the fistula was two inches above the anus, and the other as high as the point of the finger could reach; and a patient with a fistula of a similar character to the last was under my care in the hospital last year, but the state of the man's general health prevented my adopting any mode of curing the local disease.—*Brit. and For. Med.-Chirurgical Review, Oct.*, 1851, *p.* 375.

94.—*On Fistulous Communications between the Rectum and the Vagina.* By T. B. CURLING, Esq., F.R.S., &c.—Mr. Copland has the credit of having first practised the division of the external sphincter for the cure of fistulous communications between the rectum and vagina. The proceeding is applicable to another class of cases, to which I may here briefly allude. The extremity of the septum between the vagina and rectum occasionally becomes lacerated in labour, the patient being afterwards unable to retain her fæces. The cure of this distressing infirmity may be effected by paring the edges of the gap, and, after division of the external sphincter on each side, bringing them together with sutures, which should be tied in the vagina. An opiate afterwards will keep the bowels at rest for two or three days, and the sutures may be taken out on the third day. The operation does not always succeed, but the double division of the sphincter much lessens the chances of failure.—*Brit and For. Med.-Chirurgical Review, Oct.*, 1851, *p.* 376.

95.—*On Prolapsus of the Rectum, with Internal Hæmorrhoids.* By T. B. CURLING, Esq., F.R.S., &c.—In slight cases of prolapsus, accompanied with internal hæmorrhoids, in adults, the contraction that takes place after the removal of the piles by ligature, or in other ways, will often counteract the laxity of the parts, and afford sufficient support to prevent a return of the inversion. But if this should not be the case,

the tendency to prolapsus may be effectually obviated by an operation which consists in the excision of portions of mucous membrane, and a little of the skin from the margin of the anus. The patient being placed on his back in the position usual in the operation for lithotomy, a fold of membrane, more or less broad according to the laxity of the part, is to be seized with a vulsellum, or the curved entropium forceps, raised a little, and then excised with a curved pair of scissors. Two portions, one from each side of the rectum, will generally require removal, leaving two oval wounds in the longitudinal direction. It is desirable that the edges of the wound should be afterwards brought together with sutures, not only to secure the speedy healing of the wound, but as the compression occasioned thereby helps to arrest bleeding. Unless, however, chloroform be used, there is some difficulty in applying them, in consequence of the forcible contraction of the sphincter excited by the operation drawing in and concealing the wounded parts. The surgeon must be careful to tie any bleeding vessel that may be divided, for the operation is very liable to be followed by hemorrhage, which may go on into the bowel without his being aware of it. An examination with the speculum should be made before the patient is left. Cases in which this operation is called for are certainly not common. In persons who have suffered from prolapsus in childhood, it sometimes happens that the parts do not recover their tone at puberty, and that the complaint continues to prove troublesome afterwards. Such a case is very fit for excision. In 1835, I assisted my colleague, Mr. Luke, in performing this operation upon a lad in the London Hospital. He was nineteen years of age, and had been troubled with prolapsus ever since he was three years old. The bowel always descended several inches when he went to stool, and was a source of great annoyance to him. Two oval portions of mucous membrane were excised from the verge of the anus in the way above described. The sphincter immediately afterwards contracted strongly, and completely buried the wounded surfaces. There was no reason at the time of the operation to expect any bleeding; but on visiting the lad in the evening, for Mr. Luke, I was surprised to find him in a state of prostration, with a cold, clammy skin, and shivering. It appeared that on two or three occasions he had discharged a considerable quantity of blood, which had collected within the rectum. Having given him some brandy, I introduced a thick plug of lint, previously oiled, which was effected with some difficulty, owing to a strong spasm of the sphincter. There was no recurrence of hemorrhage, and the two wounds healed up in the course of a month. The operation was quite successful in preventing further prolapsus. If another case of hemorrhage from vessels at the lower part of the rectum occurred to me, I should insert a good-sized piece of sponge, which, expanding as it became moist, would more effectually plug the part.—*Brit. and For. Med. Chirurgical Review*, *Oct.*, 1851, *p.* 374.

96.—CASE OF PROLAPSUS OF THE RECTUM IN THE ADULT.

Under the care of Mr. Fergusson, King's College Hospital.

[Prolapsus of the rectum occurring in infants is a comparatively common disease, especially where there exists much laxity of the bowels and crying. The same effect will be produced by the existence of stone in the bladder, but will be removed on the removal of the stone. In other cases it is of slight importance, though, occurring among the uncleanly and negligent poor, very distressing cases are met with. In the adult it is of rare occurrence.]

When this affection attacks an adult, it is very frequently connected with the existence of internal hæmorrhoids, and the more these increase in size, uncontrolled and unarrested, the more is protrusion of the lower bowel likely to occur. When the piles are removed by the ligature, prolapsus will not take place; and the disease may, by the contraction produced by the ligatures, be completely cured, if already existing. In cases, however, where such a state of things has been neglected, matters may assume such a character as to necessitate an operation; and as the latter is but seldom performed, we shall just give a short sketch of a case of prolapsus, where Mr. Fergusson had recourse to the method generally recommended:—

Francis R——, aged thirty-eight years, of a fair complexion, nervous temperament, and who has led a very irregular life, had generally enjoyed good health, when, about seventeen years ago, he began to be troubled with hemorrhoids. About twelve years since, the patient first noticed that after much walking or straining at stool, a slight prolapse of the rectum would take place; but it is only within the last seven years that he has been severely inconvenienced by such protrusions. The patient first applied to Mr. Bowman, who advised an immediate operation, but a great deal of unnecessary delay took place on account of the man's hesitation, and he was finally admitted under the care of Mr. Fergusson, June 1st, 1851.

On examination, much loose skin was found around the margins of the anus, and upon the patient straining, the bowel protruded to a considerable extent, the mass presented a bluish and nodulated appearance from strangulation at the anus. Mr. Fergusson determined upon the excision of a great portion of skin around the anal orifice, with the hope that the contraction produced by cicatrization would greatly assist in keeping up the bowel; the patient was therefore brought into the theatre, June 7, 1851.

When he had been completely narcotised with chloroform, the rectum prolapsed to a fearful extent, the sphincter being completely relaxed by the general anæsthesia. The protruded parts were about the size of a man's fist, glistening, irregularly globular, bluish-red from congestion and a sort of strangulation at the anus, and retained by loose folds of skin. Mr. Fergusson now proceeded to take up portions of the redundant skin with the vulsellum, and cut off with the scissors five triangular pieces of skin, the base towards the anal orifice. The bowel was then returned, the parts well supported, and dressed with wet lint.

Mr. Fergusson stated that before the operation the sphincter could not act, from the great amount of loose skin around the anus; and that now there was much likelihood that cicatrization would produce a sufficient amount of contraction for the bowel to gain much support. He had performed the operation before with complete success; the radii of a circle produced by it around the anus, rendered that orifice smaller, and enabled it to guard against prolapse. It was, however, doubtful whether in the present case he had taken off a sufficient quantity of skin.

The patient progressed very favourably, though he experienced some pain; his bowels were gently kept open by emollient enemata, and in the space of about twelve days the orifice of the anus was much contracted, though some redundant skin was still existing in that locality. The improvement was steadily maintained, the bowel remained *in situ*, and the cure might have been perfected by the removal of some more skin, when the patient, who is of an eccentric disposition, left the hospital of his own accord.

Mr. Curling observes that this disease, when it affects adults, is more common in women than men. Child-bearing has of course much influence here. With men, however, "prolapsus of the rectum may be combined with internal piles, and such subjects are sometimes affected with enlargement of the prostate gland or stricture, and are accustomed to strain in passing water. This frequent forcing, as well as the habitual protrusion of the hæmorrhoidal folds, so weaken the sphincter, and relax the coats and connexions of the rectum, as ultimately to cause displacement and inversion of the bowel."

Mr. Curling mentions a case, under the care of Mr. Luke, in 1835, in which the same operation, as described above, was performed with very satisfactory results. The patient was nineteen years of age, and had been troubled with prolapsus ever since he was three years old. Two oval portions of mucous membrane were excised from the verge of the anus; the sphincter immediately afterwards contracted strongly, and completely buried the wounded surfaces. There was some unexpected hemorrhage in the evening, but the operation was quite successful in preventing further prolapsus.—*Lancet, October* 4, 1851, *p.* 311.

97.—*On Irritable Ulcer of the Rectum.*—By T. B. Curling, Esq., F.R.S., &c. In the treatment of irritable ulcer, Mr. Curling naturally places his chief reliance on incision through the centre of the ulcer, with simultaneous division of the sphincter. He speaks highly of the use of an ointment containing chloroform, as an application to sensitive ulcers. His formula is as follows:—℞. Chloroformyl, ʒj-ij; zinci oxydi, ʒss; olei olivæ, ʒj; cerati cetacei, ʒiv. M. fiat unguentum.—*Brit. and For. Medico-Chirurg. Review, October*, 1851, *p.* 372.

[The Editor of the 'Dublin Quarterly Journal,' commenting on Mr. Curling's views, says,]

We agree with the author as to the ordinary seat of this ulcer, and we

also agree with him as to the intensity of suffering of the subject of it. Yet we have met with cases where not a particle of suffering existed, and where rather curiosity than otherwise led to its detection in obstinate dysenteric diarrhœa, the cure of the latter rapidly following the attention paid to the former. Ulcer of the rectum is almost always within reach of the finger, and either wholly or partially within sight by divaricating the anal aperture or by using a polished gorget speculum or rack-dilating speculum,—much on the principle of the instrument for the vagina. The ulcer is often single, and, as our author states, curable by local means. In addition to the remedies mentioned by him, we may add to the list the salts of copper, particularly the nitrate and the sulphate. The former we have applied with very beneficial results, and we think them less painful than others in ordinary use. Ointments may in some instances succeed, and Mr. Curling mentions that he employed with good effect one containing chloroform, in the proportion of from one to two drachms to half an ounce of cerate. In cases in which we are obliged to operate with the knife we prefer the convex-bladed scalpel, as recommended by the late Professor Colles. Ulcers of the rectum are not free from occasional constitutional complication, such as struma or syphilis, and when so they demand special treatment. It must also be borne in mind that more serious lesions may coexist, which should render our prognosis cautious; thus, we recollect a case where rapid and fatal peritonitis, from perforation of an ulcerated patch of the ileum near its termination, supervened, and where the prominent features of the case were an ulcerated fissure implicating the anus and the adjoining portion of the rectum. The man, the subject of it, had been worn out and emaciated by the agony of the affection, and was admitted into hospital for its treatment on a Saturday; on the following Tuesday he was suddenly attacked, as above stated, and in twenty-four hours was dead. The only traceable lesion in the rectum was the ulcer, and an hypertrophied condition of its lining membrane.—*Dublin Quarterly Journal of Med. Science, November*, 1851, *p.* 451.

98.—ULCER IN THE RECTUM.

By Henry Smith, Esq., Surgeon to the Westminster General Dispensary.

[Mr. Smith was requested to see a respectable married woman, 30 years of age, complaining of excessive pain at the lower part of the rectum, and of great agony whenever the bowels were moved. Some months before she had contracted a discharge from her husband, of which she had ultimately been cured. There was a discharge of purulent matter from the gut. Local treatment had been tried, but with no relief. Mr. Smith says:]

On examination I found a small ulcerated fissure running up into the rectum from the right side of the anus, and, on passing the finger into the gut, a rough surface was felt, involving a third of its circumference, and extending upwards about an inch. The introduction of the finger produced horrible pain. I ordered the patient to go to bed, and to take

a dose of castor oil, to get the bowels unloaded; and, on the following day, I passed my left fore-finger into the rectum, carried a sharp pointed bistoury along it to the distance of an inch, and cut well through the lining membrane of the gut, and such of the fibres of the sphincter as enabled me to pass the finger again with scarcely any resistance. The incision was made opposite to that side which was ulcerated; a small pledget of lint, dipped in oil, was introduced, and a dose of laudanum given.

The relief from this slight operation was extraordinary; from that time she had no more pain, not even when her bowels were moved, and she was only kept to the house two or three days; the ulcer rapidly healed, and instead of suffering a life of misery, this woman became freed from her sad complaint, and restored to health.

There are few affections which produce more suffering than slight fissures of the anus or ulcerations of the rectum; they are not commonly found in persons above a certain sphere of life; but in hospital and dispensary practice we meet with them not unfrequently, especially among persons who have suffered from some venereal affection—women chiefly. They are very frequently overlooked if the patient makes any complaint; and, if the surgeon be not careful, and neglects the examination of the rectum by the finger, the origin of the suffering will not be assigned to the true cause, and, in all probability, lotions and ointments will be used in vain to the external parts for weeks and months. Sometimes only a slight fissure can be perceived to account for the patient's sufferings; but, in the majority of cases where a previous gonorrhœa has existed, this fissure will be seen running upwards to a more or less extensively ulcerated surface, and, on introducing the finger, that peculiar roughness at one spot is felt by the surgeon, which cannot be mistaken, and the dreadful pain experienced by the patient, which, combined, to a certainty indicate the disease.

It is almost useless to lose time, and put the patient to constant pain, by employing local applications; the best plan of effectually and speedily curing the affection, is to adopt that which the ordinary principles of surgery teach us with reference to ulcerations on other parts of the body, more especially those situated in parts exposed to constant or periodical motion, and this is. to keep them in a state of quietude. The mode of cure consists in making an incision, more or less deep, through the coats of the rectum. so as to remove, or rather prevent, the spasmodic contraction of the gut; if the ulcer is extensive, it will be well to divide the sphincter completely, but in some instances it will be sufficient to divide the mucous membrane fairly, and only some of the fibres of the sphincter. The proceeding is very simple, little blood is lost, and both patient and surgeon will be amply repaid by the great relief which is at once given, if the operation be properly performed. That ingenious and talented practititioner, both in medicine and surgery, Dr. James Arnott, has informed me, that a very successful remedy, in fissure of the anus, consists in passing a bougie made of yellow soap up the rectum, from time to time. I have not yet tried this plan, but shall certainly do so, on that gentleman's recommendation, in any case where the simple operation above spoken of will not be assented to.—*Med. Times, Sept.* 6, 1851, *p.* 255.

99.—*On the Morbid Anatomy of Chronic Ulceration of the Rectum.* By T. B. Curling, Esq., F.R.S.—My inquiries into the morbid anatomy of the rectum have led me to remark the frequency of ulceration of its mucous lining, not only in cases of dysentery, and as a consequence of the ordinary disease of the part, such as stricture and cancer, but as a separate affection. In several specimens which I have examined, ulceration was diffused over a considerable extent of surface. I have observed the whole of the lower part of the rectum stripped of its mucous membrane for a distance of two or three inches. This extensive disease is sometimes, indeed generally, attended with thickening and consolidation of the subjacent tissues, without diminution in the caliber of the bowel. The muscular coat is in some instances hypertrophied. In one case, the mucous coat for a short distance within the sphincter was so riddled with holes as to form, as it is described in the post-mortem book, "a perfect cribriform tissue," the submucous tissues being at the same time much thickened. I have seen the mucous membrane ulcerated in patches, the sound portions being in some places detached from the muscular fibres beneath, so as to form bridges more or less broad, or merely some narrow bands or bridles. There were frequently abscesses and fistulous passages in the thickened tissues around the diseased rectum. In two instances ulceration had produced a perforated opening communicating with the peritoneum, death having been caused by the escape of some feculent matter into the abdomen, and inflammation of the serous membrane. In other cases the peritoneum was involved in the consolidation, and inflamed without being perforated, the omentum in one case being adherent to the anterior part of the rectum.—*Brit. and For. Med.-Chirurgical Review, October,* 1851, *p.* 376.

100.—ON HÆMORRHOIDS.

By T. B. Curling, Esq., F.R.S., Surgeon to the London Hospital.

[The following observations by Mr. Curling, on account of their practical usefulness, are exceedingly valuable.]

Internal piles, when of such a size as to protrude at the anus, or when subject to inflammation, ulceration, and bleeding, so as to prove a constant source of annoyance and suffering, must be removed by operation. This may be done by excision, by cauterisation, or by ligature. Excision is the quickest and least painful of these proceedings; but there have been so many instances in which dangerous hemorrhage has occurred after the removal of internal piles with the knife, that few good surgeons now advocate the operation, or venture to perform it. Several eminent operators who have tried excision have acknowledged that they have been obliged to abandon the practice, in consequence of the serious risks which some of their patients incurred from bleeding. Dupuytren, who was an advocate for excising piles, used frequently to have recourse to the actual cautery to arrest the hemorrhage which ensued; and it is well known that Sir Astley Cooper had some fatal cases in consequence of bleeding after this operation.

Mr. Colles, of Dublin, was in the habit of transfixing the base of the tumours with a hook before excising them, to prevent their being drawn up within the sphincter, which enabled him to command a view of the parts, in the event of any vessel requiring to be tied. This mode of securing the parts affords some advantage to the operator; but it often happens in this operation, that, although the bleeding may be comparatively slight at the time the piles are cut off, a large quantity of blood escapes in the course of a few hours afterwards, and gradually accumulates in the rectum. Dieffenbach's plan is preferable to the preceding. He first passed a ligature through the base, and grasping the pile with the forceps, excised it between the forceps and the ligature, which was then tied. The pressure produced by bringing the edges together assists in preventing hemorrhage. Small elongated piles can be removed in this way without risk.

Internal piles admit of removal by cauterisation. Dr. Houston, of Dublin, in a paper published in 1843, strongly recommended the use of nitric acid for the cure of the florid vascular pile; and I have since employed this escharotic in cases of the kind. It has the advantage of being a safe and mild remedy, and is certainly well adapted for destroying the bright fungous looking pile which is often the source of hemorrhage, and the cause of much local uneasiness. Means having been taken to bring the pile well into view, the patient should lean over a table, and his nates should be separated by the hands of an assistant. The surgeon may then take a glass pen, such as is now common in the shops, with rather a large aperture at the point, and, having dipped it in concentrated nitric acid, so as to load the bulb of the pen, may apply the escharotic to the entire surface of the hæmorrhoid, until its florid hue becomes quite changed to an ash colour. No speck of red should be allowed to remain. Care must be taken that none of the acid touches the skin at the margin of the anus. The moisture on the surface having been absorbed with lint, and the part smeared with sweet oil, the protrusion may be replaced within the sphincter. The pain consequent on the application is not severe, and the separation of the superficial slough and healing of the sore occasioned by the acid are attended with scarcely any uneasiness. If the pile be not large, this plan answers very well, but it is not sufficient for the removal of hæmorrhoidal flaps and tumours of any great size.

For the cure of internal hæmorrhoids of any considerable size, the ligature is the safest and most effectual remedy. In order to apply the ligatures properly, it is necessary to promote the protrusion of the piles. For this purpose, a dose of castor oil should be given about six or eight hours before the time fixed for the operation; and a pint of warm water should be thrown into the rectum shortly before the surgeon's arrival. When the fluid is discharged, the piles will descend. The application of the ligature being a somewhat painful proceeding, chloroform may be given if the patient desire it. The operation should then be performed, the patient lying on the side with the thighs raised: otherwise the most convenient position is with the body leaning over a table, and the nates separated by an assistant. The growth to be tied should be seized with the volsellum, and drawn out. If the pile be an elongated one, a liga-

ture may be tied tightly round its base. In other cases a curved needle set in a handle, with the eye near the point, and armed with a strong silk ligature, should be passed through the base of the pile from without inwards. The needle is then to be withdrawn, the ligature being left double. The loop being divided, the pile is to be strangulated by drawing the ligatures close round the base, and knotting them as tightly as possible on each side. The other piles are afterwards to be treated in the same way. When the hæmorrhoids are large in size, a notch made with scissors on each side at the part to be girt with the ligature, just before it is tightened, will facilitate the separation without any risk of bleeding. The ends of the ligatures having been cut short, the strangulated piles should be gently pushed up into the rectum. If the operation have been performed without chloroform, a strong opiate may be given at its conclusion. Any swelling and heat about the anus that may afterwards arise, must be relieved by poultices and fomentations. No aperient should be given for several days. The tighter the ligatures are tied, the sooner they ulcerate through and come away. They generally separate in about four or five days, during which period the patient should remain in bed or on the sofa. The detachment of the sloughs leaves, of course, at the lower part of the rectum a sore surface, which bleeds slightly when the bowels are relieved, and some attention will be required until this heals. The motions must be kept soft by mild aperient medicine—as the lenitive electuary, or castor oil. If the sore be slow in healing, it may be smeared night and morning with a liniment consisting of a drachm of the *liquor plumbi diacetatis* and an ounce of the confection of roses; or it may be brushed over with a weak solution of the nitrate of silver.—*Brit. and For. Medico-Chirurg. Review, October*, 1851, *p.* 373.

[In another review of Mr. Curling's work, in 'The Dublin Quarterly Journal,' we have some additional and valuable remarks on this subject. The Editor says,]

Both as regards internal piles and the common external hæmorrhoid, much is yet to be learned, and hence, perhaps, surgeons cannot boast as to their perfectly successful management. As regards the former, we have tried every description of caustic in their treatment: the mineral acids,—particularly the nitric, strong acetic acid, the acetum cantharidis, the tincture of the sesqui-chloride of iron, the potassa fusa, and various powders,—amongst others, with probably the best effect, equal parts of the red oxide of mercury and burnt alum, but we must say that the result has rarely been a cure, unless the size and character of the hæmorrhoid favoured such treatment. Of all now named, the potassa fusa, or the potassa cum calce, is the most penetrating, but its action cannot be safely limited, and much pain attends its use. We have, however, most frequently applied the nitric acid; in some instances, as stated in the essay of the late Dr. Houston, and as confirmed by Mr. Curling, its application is almost painless, whilst in others we have seen it followed by most extreme agony, and by a train of constitutional symptoms by no means free from uneasiness to the practitioner, the nervous system being particularly implicated. We prefer for this application of the acid, small

flattened pieces of wood, not too brittle, but yet thin, and shaped like a miniature boat-oar. It appears to us to be preferable to the glass pen recommended by the author; with it the acid can be well *soddened* into the tumour, and there is no risk of an overflow, which we have seen happen more than once with the pen. But, according to Mr. Curling, "for the cure of internal hæmorrhoids of any considerable size, the ligature is the safest and most effectual remedy." Having given full directions for the mode of its application, in which we do not find anything to detain us, he says:—

"The extirpation of hæmorrhoids by ligature is both an effectual and a safe mode of treatment, and the use of chloroform removes almost entirely the pain attending it. Those adverse to the plan have magnified the risks and sufferings, and have spoken of phlebitis, and tetanus, and diffuse inflammation followed by sloughing, as common occurrences after the operation. No fatal case has come under my own notice, either in public or private practice. Some amount of danger must be incurred in every kind of operation, serious results sometimes arising from the slightest causes; and the tying of piles cannot be expected to be exempt from risks which may attend a trifling puncture in the finger. But an unfortunate result from the application of ligatures to piles is entirely exceptional; and with common precautions this proceeding must be regarded as safe as any operation in surgery."

Such view of our author is confirmatory of that of Sir Benjamin Brodie, as regards the treatment of hæmorrhoids by ligature, but is altogether opposed to that of the Dublin school. In a few cases of internal hæmorrhoids we adopted an expedient similar to that used in the treatment of ordinary nævi, and it appeared to answer extremely well; namely, passing through the tumour worsted cross threads, and loosely knotting them, and as the necessity arose, in the process of solidification, saturating these threads with sulphate of copper or nitrate of silver lotion: unquestionably the irritation produced was very tolerant and trifling.

We have now adopted, and with benefit, Sir Benjamin Brodie's plan of treating erectile tumours, namely, of puncturing with a small, narrow knife one of these hæmorrhoids, immediately passing in a fine probe, armed with fused nitrate of silver, freely moving this about, and even leaving the small portion of caustic behind.

Of all the modes of treatment, however, we are most favourable to the actual cautery; we do not mean to assert that it is always successful, but we do believe it is more so than any other plan, and the idea of it is the worst feature connected with it. Mr. Cusack has, we think, an excellent contrivance for this purpose. It consists of a strong forceps, with flattened or spoon-shaped blades, having small holes for the passage of threads to secure a piece of chamois leather, which at the time of use is well damped with cold water, and which is of course shaped so as to cover the adjoining parts; with this flattened forceps the particular tumour is seized and secured, and then the iron, heated to a white heat, and shaped according to the size and form of the hæmorrhoid, is steadily and firmly applied. One, two, or three, may be so treated in succession. In this step of the proceeding a certain amount of adroitness is requisite,

so as to limit the action of the cautery, and immediately after the object is attained successive applications of iced or the coldest water should be employed. We have met with cases both in males and in females where this mode of treatment absolutely gave less pain and more substantial relief than any others above named or described by the author.—*Dublin Quarterly Journal of Med. Science, November*, 1851, *p.* 452.

101.—PHAGEDÆNA OF TONGUE, GUMS, AND LIPS—RAPID RECOVERY.

Sarah H—, æt. 6, a strumous child of low powers, living in an unhealthy neighbourhood, near Newington Causeway. Was admitted as an out-patient on July 18th, with acute phagedænic ulceration of the side of the tongue, gums, and lips; it was of one week's duration, and was now spreading rapidly.

Caustic was freely applied. Ten grains of chlorate of potash in water to be given three times a day; and the sore to be sponged frequently in the course of the day with a solution of nitrate of silver, (three grains to the ounce).

In a few days the phagedænic action was checked; and at the end of a fortnight, healthy granulations were seen fast repairing the breach. Bark and soda were now substituted. On August 8th, the child was perfectly cured.

Phagedænic Ulceration of Gums and Lips—Cure.—Mary C—, æt. $3\frac{1}{2}$, living in Bermondsey, was brought to the surgery on March 8th, with phagedænic ulceration of the gums and inner part of the lip. She had been ailing for nearly one week, but the ulceration commenced four days back, and was now extending very fast.

Nitrate of silver freely applied. Ten grains of chlorate of potash in water three times daily. A solution of caustic (3 grains to the ℥j) to be used frequently; and a saline purge occasionally.

March 20th.—Quite well.

Phagedænic Ulceration of Groin, &c.—Recovery.—Elizabeth C—, æt. 3, a thin, spare child, living at Hackney, in a healthy neighbourhood; became an out-patient on January 24th, having extensive sloughing phagedænic ulceration of the bend of the thigh on the right side, which was of eight days' duration. She was also afflicted with worms.

Ordered a stale-beer grounds poultice; ten grains of calomel and scammony powder immediately; also twelve grains of chlorate of potash in water three times a day; and to have some meat and porter daily.

On the 26th, a great many ascarides had been expelled; the sore had improved in appearance, and the sloughs were separating.

Jan. 31st.—The phagedænic action was entirely checked, and the health much improved. To continue the medicine, and to have another dose of the powder; nitric acid lotion applied to the sore.

Feb. 21st.—Child presented perfectly well.

Phagedænic Ulceration of Labia and Bend of Thigh—Recovery.—Jane J—, æt. 20 months, a stout, healthy-looking child, brought up by

hand; living in the Kent road, in a tolerably healthy part. Had been ailing one week, was brought to the surgery with extensive, spreading, superficial ulceration of both labia and bend of the thigh on the right side, almost running into gangrene. This was accompanied with great œdema, and excessive pain and difficulty in micturition.

Ordered stale-beer grounds poultice; nutritious diet; and ten grains of chlorate of potash in barley-water three times a day.

This treatment was pursued with speedy success, subduing the phagedænic tendency, and causing a healthy action to be set up in the ulcerating surface. In a few days, a simple bread cataplasm was substituted; and at the end of three weeks the child was quite cured.

The above four cases fully prove the value of nitrate of silver in solution and stale-beer grounds as applications in phagedænic action; at the same time the effects of chlorate of potash must not be forgotten as an important agent in checking acute ulcerative spreading.—*Guy's Hospital Reports, Vol.* vii., 1851, *p.* 331.

URINARY ORGANS.

102.—ON THE TREATMENT OF STRICTURE BY EXTERNAL INCISION.

By Professor Syme, Edinburgh.

Strictures of the urethra may be divided into three classes. First, those in which there is no real organic contraction of the canal; second, those in which the contraction admits of dilatation, and may be prevented from returning by the use of bougies; and thirdly, those which either resist attempts to effect dilatation, or return so quickly after its completion as to prevent any permanent advantage from being derived by the patient.

The first class is very numerous, in consequence of the various and frequent circumstances which, independently of contraction, tend to impede the flow of urine. Hæmorrhoidal affections, and fissure of the anus, enlargement of the prostate, paralytic states of the bladder, disorder of the digestive organs, sexual excesses, and an irritable state of the urethra, with many other derangements of a functional and organic kind that might be mentioned, are apt to occasion, more or less, uneasiness in micturition, and excite the suspicion of stricture. The introduction of a full-sized bougie would of course correct any such erroneous impression, but, unfortunately, cannot always be accomplished, even though there is no obstruction, through want of practice in the use of instruments, and morbid sensibility on the part of the patient. Both he and the practitioner are thus apt to be confirmed in their mistake, and led to enter upon a course of treatment not only altogether unnecessary, but frequently very injurious. It is in these imaginary strictures that various means of remedy have acquired any credit they possess,

such as, of course, all those employed externally or through the medium of the system; and also many others of a local kind, which could not be mentioned on the present occasion without giving offence to their respective authors or advocates, and therefore may be passed over in silence, since they never can be of any practical utility *to the patient.* At the same time, I think it right to protest openly and distinctly against any evidence drawn from this spurious source, being admitted into the discussion of what may be done with most advantage for the treatment of real organic stricture.

The dilatable form of this disease may be remedied in many different ways, through the use of bougies and catheters, flexible or rigid, and introduced occasionally, or retained permanently during the period of treatment. While it cannot be denied that the object in view may be attained by any of these modes, there is as little doubt that they cannot be all equally beneficial, or free from inconvenience; and when they are compared together, with regard to their qualities in these respects, I think there should be no hesitation in giving a decided preference to the metallic bougie, employed at intervals of from two to four days, and withdrawn each time immediately after being introduced. This method, which has been characterised by one of the London writers as "*frivolous,*" affords the certain means of dilating any dilatable stricture in the course of a few weeks, not only more easily and safely than any of the other forms in which pressure is employed to widen contractions of the urethra, but also with a greater degree of lasting effect, since it appears that the more slowly the process of dilatation is accomplished, the less rapid is subsequent relapse.

The third sort of stricture fortunately bears a small proportion in frequency to the one last mentioned, but does not do so to the same extent at all parts of the urethra. It is between two and three inches from the orifice, and just before the bulb, that organic contractions are chiefly met with. Tight strictures are much more frequent in the latter than the former of these situations, but when they do occur in the anterior part of the canal, are more apt to prove obstinate than those of the posterior position. Thus, of twelve tight strictures, the proportion may be about three in the anterior, and nine in the posterior situation, and in each of them *one* of the obstinate kind. I happen to have in my possession a letter from the late Mr. John Pearson, of London, to the late Dr. John Thomson, of Edinburgh, which affords a remarkable illustration of this pathological fact in the following extract:—"London, September 26, 1804,—I have lately had under my care a case of impermeable stricture, about two inches from the meatus urinae. Being foiled in every attempt to open it, I dissected down to it, cut through the contracted part, which was as hard as cartilage, and the wound is now very nearly healed. The patient makes water in a perfectly good stream. I yesterday saw a similar case, and intend to operate on it on Thursday."

In this obstinate form of stricture, there is not only contraction of the canal, but also a remarkable thickening of the part affected, which consequently is in general distinctly perceptible through the integuments, being felt like a ring of firm consistence, and flattened form. The

bougie when introduced is firmly grasped, so as to be withdrawn with difficulty, and the patient, so far from experiencing relief afterwards, usually suffers an aggravation of his distress. It is difficult to account for these differences from the cases of ordinary occurrence, or to explain the origin of a disease so peculiar in its characters. I have not been able to trace any connection between the effect in question, and the cause giving rise to it, or to distinguish any specialty of constitution favouring its production. But that there may be some predisposition depending upon the temperament, or other circumstances of individual limitation, would appear from the hereditary and collateral connection occasionally observed between patients thus affected. A gentleman who was lately under my care for a stricture of twenty-four years' standing, told me that both his father and grandfather had died of the disease. And some time ago I divided the stricture of a patient who was one of five brothers, three of whom had died of the disease; a fourth, who is now well, had been under my care; and this, the fifth, had run an extraordinary gauntlet of treatment, of which it may be sufficient to mention a year or two passed under the care of Mr. Guthrie, who employed a succession of catheters, and afterwards caustic; a prolonged residence at Gräffenberg, under the water-cure; and a trial of Parisian homœopathy, which nearly proved fatal in a negative way, by disregarding an extravasation of urine that took place, all through the scrotum, and over the lower part of the abdomen, and but for the skilful care of M. Cloquet would doubtless have proved fatal. It is a fact of much practical importance that there is seldom, if ever, more than one contraction of the unyielding or resilient kind in the same urethra.

Having frequently had occasion to witness the distress resulting from this form of stricture, and to regret the insufficiency of any known means of remedy, I had great pleasure in communicating to the profession a safe, easy, and effectual method of overcoming the difficulty, which consisted in dividing the contracted part of the canal upon a grooved director passed through it. The speedy and complete relief thus afforded, even in cases of the most protracted and aggravated suffering, is one of the most gratifying services that can be rendered by the art of surgery. The favourable anticipation originally entertained of it has been more than realised; and any patient who continues to suffer from obstinate stricture, can no longer attribute his wretched state to the imperfection of surgery. In the present and following papers I propose to illustrate and confirm the statements which have hitherto been offered in favour of this treatment.

I have represented it as secure against the ordinary dangers which attend operations on the urinary organs,—namely, hemorrhage, inflammation, and infiltration of urine; and may now appeal to the evidence of forty-four cases which I have thus treated without encountering any of these effects, even in a single instance. It is quite true that through awkwardness, or defective acquaintance with the parts concerned, the artery of the bulb may be cut, and other errors of a serious nature be committed, so that I am not prepared to deny the allegation of this procedure being attended with danger in "inexperienced hands." But any man of ordinary skill, who chooses to follow the directions which I have given for

conducting the process, will find little difficulty in accomplishing it. And here I may remark, that my commentators who speak of "long incisions" in the perineum, and laying open the urethra to the extent of several inches, have no warrant for such statements in anything that I have said or written on the subject. I never open the urethra beyond the extent of an inch, and seldom beyond that of half, or two-thirds of an inch.

The bleeding at the time of the operation hardly ever exceeds one or two teaspoonfuls; but occasionally takes place some hours afterwards, to the amount of an ounce or two, being apparently proportioned to the hemorrhagic disposition of the patient, and therefore to be deemed rather salutary than otherwise. If any circumstance should render it desirable to prevent the chance of this discharge, a piece of lint put into the wound at the time of its infliction will effectually do so.

As to the question of "impermeability," I simply maintain, that if the urine passes out, instruments may always, through care and perseverance, be got in beyond the contraction. It should be observed that the case here is quite different from that of a distended bladder requiring *immediate* relief. I have never maintained that in such circumstances the introduction of a catheter was always practicable; and although in the course of two and twenty years of hospital practice I have not happened to meet with a stricture that resisted this instrument, I neither profess security of being equally fortunate for the future, nor teach such confidence to others, especially if they are not to be daily practised in overcoming obstructions of the urethra. In my 'Principles of Surgery' it is said:—"If the surgeon possesses the requisite tact for introducing instruments into the bladder through the urethra, and has the treatment of the case from its commencement, he will very rarely, perhaps never, be under the necessity of resorting to this puncture. But should he not be able to draw off the water by the catheter, either from his own want of dexterity, or from the existence of obstacles arising from mismanagement or previous organic alteration of the passage, as stricture or enlargement of the prostate, complicated with a lacerated, softened, swelled, and bleeding state of the lining membrane, caused by forcible attempts to pass an instrument, there can be no hesitation in having recourse to the operation. Puncture of the bladder, however performed, is always attended with more or less danger of urinous infiltration: but a doubtful remedy is better than none; and there are few states of disease more hopeless than complete retention of urine, permitted to follow its own course."

But if sufficient time and opportunity be afforded, I firmly believe that every stricture may be rendered permeable. I feel deeply impressed with the importance of this principle, and, with the view of establishing it,—not, certainly, to obtain an advantage over my professional brethren,—I have again and again offered to undertake the treatment of any stricture, however impermeable it might be deemed, that was sent to the hospital. All those hitherto received have been afforded complete relief, either by simple dilatation, or by incision after being rendered permeable; and I venture to hope that the results in future will be no less satisfactory.

With regard to the permanence of effect obtained through incision, in my earlier communications I could only express the expectations which seemed to have a reasonable foundation; but now, with the advantage of seven years' experience, I am able to speak more decidedly on the subject. It is well known that cuts, lacerations, and even slight bruises of the urethra from external violence, are almost sure to occasion stricture of the canal, unless a full-sized instrument be passed occasionally for a few weeks after the injury has been sustained; and I have, therefore, always considered attention to this circumstance essential for success. The first three cases of stricture at the bulb in which division was effected, after being treated in this way, seemed so completely divested of their contractile tendency that I expected it would never be necessary to use any precautionary measures by introducing bougies beyond the period just mentioned, immediately subsequent to the operation. In many patients this expectation has been fully realised, but in others it has been found necessary to introduce bougies for a longer time. How far these exceptions may depend upon some imperfection in the performance of the operation, the mode of healing in the wound, irritability of the system, or impropriety in the patient's mode of life, it is not very easy to determine at present, although more definite ideas may probably be acquired from more extended observation. In the meanwhile I feel warranted to state, that if the stricture be thoroughly divided, and a full-sized bougie be passed occasionally for a month or six weeks afterwards, the patient will certainly obtain complete relief from all the distress which attends the obstinate form of the disease, and require at most merely the precautionary treatment which is found sufficient to prevent the ordinary form of stricture from being troublesome. In illustration of what has been stated, I will now commence a relation of facts, which shall be continued so long as such information seems to be required by the profession.

Immediate Effects of the Operation.—As it has been alleged, and perhaps believed, though I should hope by few, that, in order to recommend the treatment of stricture by external incision, I have glossed over the unpleasant consequences of this procedure, and made it appear less formidable than the reality, I hope the following evidence will satisfy every reader who entertains any doubt upon this part of the subject, that I have not underrated the effects of the operation. To show that I do not resort to division of strictures unnecessarily, as had also been insinuated, or until dilatation is found altogether unavailing for the patient's relief, I stated in the last Number of this Journal the leading particulars of all the cases which had been subjected by me to operation in the Royal Infirmary, during the winter session just concluded. They amount to seven in number, and, together with an eighth which has since occurred, were treated publicly in the hospital. All the operations were performed in the theatre before the most numerous class of surgical clinical students in her Majesty's dominions, who can testify that the object in view was always attained without delay or difficulty, and that in no instance did the bleeding exceed in amount a teaspoonful.—*Monthly Journal of Med. Science, June,* 1851, *p.* 534.

[The following is another case brought forward by Mr. Syme in illustration of his treatment. Symptoms of stricture were first detected, in a midshipman, in 1829, but no instrument could be passed; bleeding and hot baths being resorted to. This state continued until 1836, though, during the time, he states his having suffered comparatively little, except having to make water by drops. At this time a severe attack came on, and his sufferings were extreme; but nothing larger than a No. 4 catheter could be introduced. In 1839, his sufferings were so great that he was obliged to leave an expedition upon which he was engaged. Having returned to England, he placed himself under the care of Mr. Guthrie, who succeeded in passing a No. 6 catheter, but no larger, and in a month after the passage was as small as ever. Mr. Syme states:]

In commencing the treatment of this case, I found little difficulty in passing bougies from the smallest size up to No. 5, but then encountered a resistance which, instead of yielding to dilatation, was increased by every attempt to accomplish it, with aggravation of all the symptoms. Under these circumstances, and considering the patient's history, I recommended division of the stricture, and performed it in the usual manner. The operation was completed without the slightest difficulty or delay, with hardly any pain, and with no bleeding. There was no uneasiness or disturbance afterwards, so as even to interfere with reading to make the time pass. At the end of forty-eight hours I removed the catheter, and left the patient apparently quite well. In the evening I was sent for, on account of his being suddenly seized with vomiting and violent shivering, soon after making water for the first time. To any one inexperienced in the operation, the case would then have assumed a grave aspect, and suggested the suspicion of urinary infiltration; but as attacks of the same kind, though seldom so severe, were familiar to me as nervous symptoms attendant upon the urine resuming its natural channel, just as frequently happens after the operation of lithotomy, I begged the patient and his friends to dismiss any apprehension, assuring them that all would be right in a few hours. Accordingly, next morning I found no trace of the evening's disturbance, and from that time forwards everything went on well. The patient at once felt relieved from a load that had pressed upon him more or less severely for so many years, and quickly regained his health and strength; so that, while still under my care, having an offer of service similar to that which he had previously been compelled to decline, he did not hesitate to accept it; and, although circumstances afterwards prevented the expedition of which he was to have had the command, there was no longer any difficulty on his part. He continues in the enjoyment of perfect health, and in writing to me has thus expressed himself:—"I may now say, too, that no words can express the delight I feel at finding myself free from this horrible complaint, of which upwards of twenty years' experience has assured me that a cure could not have been effected by any other means."—*Monthly Journal of Med. Science, July,* 1851, *p.* 19.

[The following case is given as an illustration of the immediate effects of this operation.]

R. L., aged forty-five, a railway porter, recommended to my care by

Dr. Flucker, of Berwick-on-Tweed, entered the hospital on the 25th of January last, in a sad plight from the combined effects of stricture, fistula in perineo, and phymosis. The integuments of the penis, scrotum, and pubes were greatly swollen and indurated, so as to present a most formidable appearance of morbid derangement. The prepuce was not only contracted, but singularly elongated and contorted, so as to form a spiral appendage extending several inches beyond the glans. The scrotum and perineum constituted one mass of induration, with deep fissures and fistulous openings, through which the urine passed without being under control by the patient, who was thus kept constantly in a state of the greatest discomfort. The disease, it was stated, had commenced between five and six years ago.

On the 27th I cut away the redundant portion of prepuce, and united the edges of the skin and mucous lining by sutures.

On the 30th I made a free longitudinal incision through the raphé, and directed poultices to be applied.

On the 1st February, the swelling being greatly reduced, and more free access to the urethra having thus been obtained, I succeeded in passing No. 1 bougie through the stricture, which was anterior to the bulb.

On the 10th February I passed a grooved director into the bladder, and divided the stricture by external incision. There was not more than two teaspoonfuls of blood lost at the operation, and none at all afterwards. The catheter was withdrawn at the end of forty-eight hours.

The patient rapidly improved from day to day, and was dismissed in every respect perfectly well on the 11th March.

Case of Illustration of the Remote Effects.—Six years ago, a gentleman, about forty, applied to me on account of stricture, for which he had repeatedly been under the care of Mr. Liston, both here and in London. I succeeded in dilating the canal, and gave the patient bougies to pass occasionally in order to prevent relapse. Although able from long experience, to do this very expertly, he found it impossible to keep the canal patent to the full extent, and every few months returned to get another stretch. As he resided on his estate, at the distance of about sixty miles from Edinburgh, these frequent journeys were not very convenient, and he also began to fear that the stricture was gaining ground, so as to render his efforts inadequate even for palliation. In these circumstances he requested me to divide the seat of contraction, which was at the bulb, and I did so in the month of March, 1847. Not the slightest bleeding, or other inconvenience, was experienced, and the water flowed entirely by the natural route. After this the patient still passed a bougie occasionally, but no longer felt any difficulty in doing so, and was also relieved from a variety of unpleasant feelings which had previously annoyed him, even when the urethra had been fully dilated.

About two years ago this gentleman suffered an attack of hemiplegia of the right side, which so impaired the use of his hand as to render him unable to pass the bougie, and then he ascertained the full extent of benefit derived from the operation, since the complaint, instead of becom-

ing rapidly aggravated in this helpless state, has been found, upon examination, to show no troublesome disposition. I passed the full-sized bougie lately with perfect freedom, after a lapse of twelve months, during which no instrument had been introduced.—*Monthly Journal of Med. Science, August* 1851, *p.* 146.

[The following is another case recently added to the list which Mr. Syme has brought forward in support of the superiority of his operation.]

J. H., aged forty-three, late sergeant in the ——— Dragoon Guards, was admitted into the Royal Infirmary on the 19th June, on account of stricture. He stated that the disease had originated from gonorrhœa, and troubled him for eighteen years,—in the earlier part of this period being relieved from time to time by the introduction of instruments, but latterly resisting all attempts to accomplish this, so as at length to require his discharge from the army, which had taken place seven months before. During the last eight or nine years, he said, that although under the care of very many practitioners, civil as well as military, some of whom had tried daily for months to introduce instruments, *he never had had one passed through the stricture.* About six years ago an attempt had been made to force a way through the contracted part, which was at the bulb, by means of a lancet-catheter, but without success. Notwithstanding some relief which the patient had derived from passing a flexible bougie down to the obstruction, which he did daily, all the symptoms of stricture existed in a very severe form, the urine frequently escaping only by drops, and not being always under the power of retention.

After repeated ineffectual attempts, but without ever drawing a drop of blood, I succeeded on the 6th of July in passing a No. 1 bougie fairly into the bladder. I then endeavoured to carry on the dilatation, but without success, and in order to obtain room for the introduction of a grooved director, on the 11th tied in a catheter of the smallest size. On the 13th, as the patient began to complain of this instrument, I removed it, and found that the grooved director could be passed with ease. Circumstances induced me to delay the operation until next day, when I found that the canal was again so tightly contracted as to admit only the small catheter, which was therefore retained for other two days. On the 16th I performed the operation as usual,—the patient declining chloroform, and treating the affair as unworthy of complaint. The catheter (No. 7) was removed on the 18th, and the urine then issued in a full stream entirely through the urethra. A few days afterwards, the patient, having got up and walked about, found that a part of the water escaped by the wound, but soon observed the amount of what passed in this way diminish to a few drops, and on the 6th of August reported himself quite well. He was dismissed cured on the 12th.

With regard to this case, it may be remarked, in the first place, that the disease which was the subject of treatment had deprived the army of the finest looking soldier I have ever happened to see. Secondly, it affords an instance of a stricture for nine years reputed impermeable by metropolitan as well as provincial, public as well as private surgeons, but which, nevertheless, proved permeable to the simple bougie, when

employed under the impression that there is no true impermeability. Thirdly, the case presents another instance of the ease, safety, and efficiency with which the most obstinate stricture may be remedied by incision upon a grooved instrument passed through the contracted part of the canal.

I have now operated, without the loss of a single life, on fifty-one cases of stricture deemed irremediable under ordinary treatment; and I therefore venture to hope that the persuasion which I originally expressed as to the operation, when properly performed, being absolutely and entirely free from danger, will not appear unduly sanguine.—*Monthly Journal of Med. Science, Sept.*, 1851, *p.* 235.

[On this subject the 'British and Foreign Medico-Chirurgical Review' concludes a searching article with the following observations:]

Strictures of the urethra had often been divided upon a grooved director, or its equivalents, before Mr. Syme wrote; but to him undoubtedly belongs the merit of systematising the operation, and of exhibiting its peculiar advantages. He has shown that it is a proceeding of no great hazard, and far more effectual than the old operation without a director, as well as much less dangerous to the patient. On this head Mr. Syme observes, in the 'Edinburgh Monthly Journal' of April last:

"As to the danger of the operation, I contend, that if the incision be made in the mesial line of the perineum, there is no vessel of the slightest consequence that can be cut; and that, if the deep fascia of the perineum is not divided, which it never requires to be, there cannot take place extravasation of urine, unless, perhaps, forwards in a slight degree into the scrotum, where it may occasion a little suppuration, utterly unworthy of attention, when compared with the great object in view. I therefore maintain that the operation is absolutely free from danger; and appeal to the fact, that I have performed it between forty and fifty times without a single fatal result."

The statement here quoted may be somewhat too strong; for all operations performed on patients suffering from long-standing stricture are notoriously hazardous; and in severe instances, this very operation has ended fatally. The danger arising from hemorrhage has probably been altogether exaggerated, especially by Mr. Lizars and others.

The important point remains, to determine to what classes of stricture the operation is applicable, and whether the result is permanent or the reverse. It is idle to say that most strictures can be cured, and ought to be cured, by the simple bougie; no one doubts the truism, and least of all Mr. Syme, who throughout his writings has been careful to guard against the indiscriminate adoption of the perineal section. But there *are* strictures, which we believe to be absolutely irremediable, except through some such operation as this.

That form of stricture, or almost obliteration of the canal, which takes place after rupture of the urethra from injury, is, we conceive, likely to be very greatly benefited by division; and likewise that kind of stricture which contracts again almost as soon as it is dilated, and which has been called elsewhere the resilient stricture.

Lastly, also, where time is of the utmost importance to the patient, as in the case with many labouring men, the operation would, we conceive, be justifiable, when the stricture is very obstinate.

Of the permanency of the cure, we have no sufficient evidence; but that after division, the disease *may* never return, is clear enough from the history of Mr. Syme's first patient, and is also supported by a case reported in the 'Medical Times' of April 27, 1850, by Mr. Henry Smith, in which the old operation was performed by Mr. Fergusson. The reverse of this is likewise proved, however, both by Dr. Dunsmure, and by others; and, therefore, every prudent person would advise the occasional introduction of a bougie after this operation; as after the cure by simple dilatation.—*Brit. and For. Medico-Chirurg. Review, July*, 1851, *p.* 146.

103.—ON THE TREATMENT OF STRICTURE OF THE URETHRA.

By G. J. Guthrie, Esq., F.R.S., &c.

[Speaking of Mr. Stafford's mode of dividing stricture of the urethra, which consists in excising the stricture by means of a small lancet or other shaped knife, passed along a straight or curved catheter, having a slit in the point, Mr. Guthrie states, that a small obstruction may be divided in this manner safely; but if greater in extent, or more solid in consistence, the operation is attended with danger, and has even failed altogether.]

For the purpose of securing the passage of the dividing instrument in the right direction, Mr. Stafford proposed to pass a fine wire through the stricture in the first instance, and then to run his knife along it: a grooved director has been suggested by others, The difficulty is, however, to pass the wire or director; for when a wire can be safely passed through a stricture into the bladder, the disease ceases to be immediately dangerous; the urine can be drained off, and the passage may be quickly enlarged, so as to admit of a safer mode of proceeding—viz., by dividing the obstruction from behind forwards. This enlargement can be accomplished by running a hollow instrument over the wire which has been passed, after the manner lately recommended by Mr. Wakley, junior, and it is impossible to speak too highly of this invention,—or as it is disputed as an invention, and claimed by others,—of its re-introduction into practice, as a means of effecting either a slow or a rapid dilatation of the urethra. It is, like all other potent means, liable to do much mischief as well as good, when in incautious hands; and in cases of long standing cannot effect a permanent cure any more than any of the other dilating methods more commonly in use. It is capable of rendering great service when the withdrawal of a sound or catheter cannot always be certainly followed by the re-introduction of another, and which withdrawal it renders unnecessary until a larger one is introduced over it—a very great improvement, which no surgeon should neglect, for when this can be done, no operation is immediately necessary. M. Leroy d'Etioles has recommended a similar mode of cure, or of forcible

dilatation, by passing in immediate succession several graduated instruments until the last fills the urethra; thus stretching or lacerating the stricture, sometimes effecting a cure in a few days, sometimes giving rise to inflammation of the bladder or other evils, which few people like to contemplate. These means, as methods of cure, can then only be recommended when from circumstances, the patient cannot afford time for more gentle treatment. They succeed frequently when the disease is confined to the mucous membrane; and some of the best and most prominent cures I have effected have been in such cases, and when I have felt that the edge of the stricture has caught upon and yielded to the pressure of the point of the instrument: whence my predilection for the more surgical proceeding, by division from behind forwards, when it can be effected.

When no immediate urgency presses for the hasty completion of an operation, as in ordinary cases of intractable stricture, permeable to a certain degree to the urine, although not to an instrument, it is always best to proceed with gentleness; for I have often found that an instrument can be introduced at one time, when it totally fails to proceed at another. Mr. Syme has denied the impermeability of stricture to a small instrument under any circumstances, which denial does not gain implicit credence with the best informed members of the profession of surgery, although all ought, and I hope do admit, that his efforts to impress on the members of that profession the necessity of continuing their endeavours to find a passage until they succeed if it be possible, are deserving of the highest praise.

The width or extent of a stricture can always be ascertained when it is passable by a small silver or whalebone sound having a little bulb at the end, which on being withdrawn is caught behind the stricture, and comes through it with a jerk, thus showing its thickness.

Case 8.—An officer applied to me with two strictures, one an inch from the orifice of the urethra, the other at about four; he suffered greatly from irritation and a frequent desire to make water, which rendered his life very uncomfortable, although he could pass a bougie of small size easily. Both strictures were divided on different days with facility, one from before backwards, the other from behind forwards, and the cure was rapidly completed. This gentleman does not pass a bougie, has had no return of the complaint, has married, has three children, and boasts of his cure.

Case 9.—A gentleman had been under the care of several surgeons as well as myself, and could pass a No. 14, and even a 16, in a satisfactory manner, but his uneasiness about the bladder and the urethra was not removed; and if he neglected to pass his instrument for a couple of months the canal contracted a little, so as only to take a No. 12, and a slight ridge was felt as the sound passed over the part. This I divided, with the happiest effect; the uneasiness was no longer felt, and he now only passes his sound to be quite sure his complaint is not returning, but not to prevent its return.

Case 10.—A serjeant of exemplary character was sent to me by his commanding officer, suffering from an impassable stricture, and rendered thereby unfit for further service unless I could give him relief. The

stricture was at the bulbous part of the urethra, through which I could not pass either a soft or a solid instrument without more force than I thought fit to employ. A slight division of the face of the stricture enabled me to carry a small silver catheter through it, which was retained in the bladder. Exchanged in succession, for others somewhat larger, the cure was apparently completed by dilatation, and he returned to his duty free from complaint, with the direction to pass a solid sound once a week. This he failed to do, and in less than two years he returned to me nearly as bad as before. The stricture was entirely divided this time, and he again returned to his regiment. He has remained well many years, not forgetting to pass his sound from time to time, that he may be sure his complaint shall not return.

Case 11.—An officer of the navy applied, in consequence of an intractable stricture at the termination of the bulbous part of the urethra. He had been under thirteen different surgeons, who had never been able to pass an instrument into the bladder, and was subjected to rigors amounting to a paroxysm of ague, whenever the surface of the stricture was irritated by even moderate pressure. It was evident to me that nothing but incision was likely to succeed. A slight one rendered the small orifice of the stricture more open, and a very small sound was with some difficulty carried into the bladder; this was replaced by larger ones until he could pass a bougie equal to the size of his urethra, which he does from time to time, and remains well, although the occasional passage of the bougie is necessary to prevent a relapse.

Case 12.—An officer of the Indian army applied to me in consequence of a hard elastic stricture at the termination of the bulbous part of the urethra, on its becoming membranous, which gave him great annoyance, though passable and dilatable. The dilatation could not be maintained by any sized bougies. The obstruction was always felt by the instrument in passing over it, and more or less uneasiness was always present, As he was desirous of being relieved at all hazards, I divided the hardened part, or ridge, with a full-sized instrument, which then passed into the bladder with ease. A little discharge of blood took place, but not more than frequently follows on such occasions. The next day I found that he had had an oozing of blood all night, that he could not make water, although the desire was constant, and was in great pain, the bladder being much distended. He had had rigors in the night, followed by considerable fever, thirst, foul tongue, headache; the oozing of blood continued, accompanied by the occasional discharge of a few drops of bloody urine, and of some clots of blood. A middle-sized silver catheter passed with ease, although very little bloody urine came through it, and it was evident a larger quantity of blood had passed backwards, and had coagulated in the bladder, than had been discharged externally. Relief was given by injecting the bladder from time to time with warm water, by opium, and the hot bath, &c. The cold and hot paroxysms of fever returned regularly, which he considered to be his Indian malady, and were ultimately arrested by quinine. His complaint was, however, cured, and has not returned during the last six years, as he calls to be examined from time to time. This was the most distressing case of hemorrhage I have met with, although it sometimes occurs, but to a less

extent, after this operation, but not sufficient to excite alarm, or give rise to any serious inconvenience.

Case 13.—C. P—— applied to me on his return from India in a miserable state of health, unable to make water even in a small stream, from strictures, which admitted with difficulty the smallest bougie. The first was situated two inches from the orifice; the second at the junction of the bulbous with the membranous portion of the urethra, under which he had laboured for several years. The first could be felt as a very hard swelling in the under part of the urethra, near half an inch in extent, and on which dilatation and caustics, used by different surgeons, had made no permanent impression. This part I divided from before backwards, so as to admit a No. 6 catheter, which after a time passed through the second, and his health rapidly improved as the irritation was removed. The hardness in the first stricture did not diminish, and it was again divided, so as to admit a No. 9. A small calculus was now discovered behind it, lodged in a hollow it had made for itself, and in which it had perhaps increased in size. This, after repeated trials and the further division of the stricture, was happily brought through it, but passed the orifice of the urethra with great difficulty. A catheter the full size of the urethra was kept in the bladder, and the posterior stricture was removed, but the anterior one remained hard and frequently somewhat irritable, although his health was quite restored, and he could pass a No. 8 easily. It was again divided as deeply as was thought advisable, and the nitrate of silver ointment applied, which always removed the irritability; so that by passing his bougie himself, and occasionally applying the ointment, he kept himself in good health. With the view of making a more permanent cure, a consultation was held, and the iodide of potassium ointment applied externally and internally, instead of the nitrate of silver ointment, but did not answer so well. He ultimately returned to India in excellent health, satisfied to pass his bougie and use his ointment occasionally. He has remained free from inconvenience, having since his treatment passed several small lithic acid calculi with little difficulty, although the hardened ring of the stricture was always to be felt, and is still, I have no doubt, perceptible.

Case 14.—A poor man was admitted under my care into the Westminster Hospital, with a diseased bladder and strictures; the first of which, about two inches from the orifice, had become impassable, so that his water, which he could before only make by drops, was now entirely retained. As he had suffered much, and appeared to be in an almost irrecoverable state of health, requiring immediate assistance, if it could be given in time to be of use, I divided the *first* strictures, which were hard and double, extending for an inch, with a small interval between them, with an instrument as large as the orifice would admit. This gave him great relief, as he could then pass his water in a small stream. Two days after, some urine came through into the skin of the penis and scrotum, which required to be divided to allow of its exit, and a fistulous opening would thus have been made, if the man had not died exhausted by the long continuance of his complaint.

Case 15.—A short, fat gentleman, of 63, informed me, in May, 1850, that he had been under my care, for retention of urine, twenty years

before, and that he had left me when I could pass a No. 12 with ease, being as large an instrument as would enter the orifice of the urethra; and that he had done nothing since. He was nearly as bad as before, his water passing only by drops. The obstruction was at the termination of the bulbous portion of the urethra; and although a very fine gum elastic or catgut bougie could be made to enter the stricture, and stick fast in it, neither they, nor the smallest solid one, would proceed, without a force being used which I considered incompatible with safety. Having neglected to call for a few days, he sent for me, saying, he was totally unable to pass a drop of water, and had not done so for nearly two days, the bladder being distended as high as the umbilicus. There was no time to be lost, if his life was to be saved. I therefore divided the obstruction, which was very thick and tough, with great difficulty. The cutting part being sheathed, the instrument could then be felt per rectum, advancing to the prostatic part of the urethra; but it would not enter the bladder, nothing could make it do so. It evidently caught upon something at the very entrance into it, and I concluded it must be on the bar I have indicated as often existing at this part. This I divided; the instrument then entered the bladder, and three pints of urine were drawn off through it, when it was exchanged for a soft metallic catheter. The general bad symptoms gradually subsided, the urethra remaining hard and lumpy where the division had taken place. In August, I took my leave of him, in a very comfortable state, passing his gum catheter twice a day, and making his water occasionally very well. At Christmas I saw him, when he declared himself free from any uneasiness. In February, he suffered an attack of bronchitis, for which he did not ask my assistance, although I paid him a visit of condolence, declaring himself well of my complaints—that is, of the bladder and urethra. In April, he died from a fit of apoplexy, and his friends would not allow of an examination. The surgeon who attended with me did not hesitate in saying, that if I had performed the operation by opening the perineum he would not have lived many days.

Case 16.—H—, returned to England from Australia, in July, 1848, having suffered severely from an impassable stricture, placed himself under the care of several very eminent surgeons in London, who tried various methods and inventions, and ended by making him a false passage, admitting a No. 7 for eleven inches, but which could not be got into his bladder. All this time he suffered severely in his health, from repeated attacks of aguish rigors, and was told, at last, that nothing could cure him but being cut in the perineum, to which he had a serious objection; and instead of going to Edinburgh, as advised, returned from the country to London, and was advised by the subject of Case No. 8 to go to Mr. Guthrie, with the determination to be cut on the inside of his urethra, if he pleased, but not on the outside. The operation was performed, after due preliminary examination, on the 27th of March, and a catheter introduced, which gave him great relief with respect to his water, but was followed by some fever, but not sufficient to prevent his going to Mr. Guthrie's house after the first few days. A swelling then formed at the anterior part of the scrotum, which was opened, but contained only matter, without any sign of urine. Pain, supposed to be

rheumatic, next affected the back part of the left shoulder, and was soon followed by swelling, without discolouration. As this was supposed to contain matter, it was punctured, on the 30th of April, by a very small trocar, and six ounces of good pus were allowed to run through it. The operation was repeated every second or third day, for three times, when the little opening was enlarged, and the discharge gradually ceased. A No. 12 silver sound was passed every other day, and he left London, doing it for himself, at the end of May, in health and spirits. This gentleman was fortunate in having his matter deposited first in the scrotum, and afterwards under the muscles of his back.

The division of a stricture from behind forwards, implies that it is passable by an instrument of moderate size, say a No. 4, 5, or 6, and that the operation is not consequently one of necessity but of choice, with the hope that it may lead to a permanent cure, which it is very likely to effect. In many cases of intractable strictures, I have found it advisable to puncture the fore-part, without attempting to divide the whole thickness of the stricture at once, and have thus been enabled in many instances to introduce an instrument which cut from the side and not from the point, thus depriving it of its most dangerous quality. The instrument I place before you was made more than twenty years ago, by Messrs. Philp and Whicker; it is one of several, having each a somewhat different inclination. The instrument is round, straight, and of equal size throughout unto the end, the under part of which forms a bulb or ledge sufficiently developed to catch against the stricture when passed through it, and then withdrawn until it meets with the check the inner side of the stricture occasions by catching against the ledge or bulb. The cutting part being then protruded on the under side by the pressure of the thumb on a spring, the instrument is to be drawn through the stricture, which it divides; the pressure of the thumb being removed, the cutting part returns into its sheath, or it may, if found necessary, be pushed forwards through the stricture, thus deepening and completing the cut already made, or even making another by the side of the first, if thought advisable. The operation thus simplified may be repeated if required with a larger instrument, until the wall of the urethra itself, as well as the stricture, are both completely divided, if it should so please the surgeon; a proceeding which appears to me to be of more than a doubtful nature. The error, when one is committed, lies in trying to do too much at once, for although an insufficient incision will not effect a cure, there is no difficulty in augmenting either its length or its depth, when the insufficiency is manifest. It is a point to be acquired by experience, and the surgeon will soon learn that the incision, however well made, is never equal to the width of the blade of the instrument, from the natural receding of the parts. It should extend from a little behind quite through the stricture, and about a line in front of it, and a ledge should not be left behind on which the point of a bougie can hitch. When the division of the stricture has been accomplished, a straight sound, very slightly conical at the point, should be passed through it, until the distention *begins to give pain*, when it should be withdrawn, to be re-introduced again next day; until by successive introductions, and if necessary by successive divisions,

the thickened or hardened parts have been absorbed, and the canal becomes free.

The division of a stricture, whether done from behind forwards, or before backwards, gives rise in some persons, to a sympathetic fever, resembling ague, which may continue for several days; but the same thing takes place in many irritable habits from the mere introduction of a common bougie, and is an evil which cannot always be avoided by the greatest care or gentleness. I have known a hemorrhage of a more serious nature follow, in the ablest hands, the introduction of a common silver or elastic catheter, than that which sometimes supervenes after the division of a stricture. If this should not cease, in due time, under the application of very cold or iced water, a full-sized bougie should be introduced into the bladder, and pressure made upon it at the part injured. When much force has been used, or the outer wall of the urethra has been too much implicated, an ecchymosis of the external parts is said to take place, although it has not occurred to me. Urine may be extravasated, matter may form externally, or be discharged in quantity from within. These are accidents it is proper to enumerate, and which may befal any one, although they do not often occur, and are not to be expected when the treatment is conducted with sufficient caution and judgment.

In whatever manner the urethra may be divided, whether for a stricture only, or for a fistula in perineo, any and every operation may lead to the excitement of a fever resembling ague in its paroxysms, and to the formation of matter in different parts of the body in a similar manner to that which I believe I was the first to show did often happen after amputation. It is a misfortune which cannot be avoided, and he is fortunate in whom these depositions of matter occur in parts not essentially vital, as in Case 16.

Case 17.—J. G ——, aged thirty-one, has resided fourteen years in India, and has suffered from stricture during the whole of that time. "In 1838 a No. 8 could be passed into the stricture, but not into the bladder, which relieved me a little, but a discharge remained. In 1842 a No. 4 would not pass. In 1845 a No. 9 would go through the first obstruction, but not into the bladder. In 1849, being worse than ever, I placed myself under another surgeon, who succeeded in passing a No. 1 into the bladder, and at last a No. 9, but only with great pain and force, so that it could not be withdrawn, only by putting a purchase upon it to pull it out. A swelled testicle, and an abscess in the scrotum, followed this treatment, and a gleet has been present since 1838, with great irritation and suffering. In April, 1851, I applied to Mr. Guthrie, having come from India for this purpose. He passed a small 5 with difficulty, and stated that I had three strictures—one half an inch from the orifice, which felt like a ring; the second, immediately in front of the scrotum, which felt hard, like a cord, for the space of an inch, and a third, at the curve, which he called a natural obstruction, but against which for several years my bougie always stopped. Mr. Guthrie divided my second stricture from behind forwards, so as to admit a No. 8 with ease, and which removed at once all my sufferings. The first stricture was divided a few days afterwards, and a No. 11 went

into the bladder without difficulty, leaving me in a perfect state of bliss. I can now pass a No. 13, and think myself cured."

I have selected these cases from a great number, because each proves a leading point; and from them I shall now draw such conclusions as they appear to admit.

Conclusions.—1. That a hard and elastic, or an intractable stricture is never permanently cured by dilatation, or by the application of caustic, although it may be materially relieved by the regular periodical use of a dilating instrument.

2. That the division of an old, hardened, or elastic stricture through the perineum is not usually followed by a permanent cure, although it is always attended by immediate relief. The disease being apt to return unless a solid sound or catheter is occasionally passed to prevent it.

3. That the operation of dividing the perineum and urethra in such cases is sometimes attended by severe hemorrhages, by fever, and is occasionally followed by fistulous openings, giving rise to much inconvenience.

4. That such division does, in some instances, effect a permanent cure.

5. That the division of the urethra through the external parts should never be attempted in any portion of it anterior to the bulb, such operation not being necessary; for the narrowest stricture of the pendulous or movcable part may always be divided internally with much less comparative danger than by the external incision, inasmuch as the instrument can be guided through this part by the finger and thumb of the left hand of the surgeon with a certainty almost unerring.

6. That the stricture considered by all surgeons as the most important and difficult of cure—viz., at the termination of the bulbous portion of the urethra—may always be divided, when impassable, by a *straight* instrument, and in general more easily than by a *curved* one; the use of which is founded on the erroneous belief that the stricture is situated in the membranous part of the urethra, instead of being, as it is, anterior to it.

7. That the division of a stricture should, if possible, be effected by an instrument passed through it, and cutting from behind forwards, rather than from before backwards, although a combination of both methods will frequently be necessary to ensure success.

8. That the division of a stricture by these means will not always ensure a permanent cure if more than the mucous membrane is implicated, unless such parts be divided also.

9. That in cases of intractable stricture, the mucous membrane, the inner layer of involuntary muscle, and the elastic tissue external to it, should be divided, when the operation is done from within, but not the outer layer of muscular fibres, which should remain as a barrier between the stream of urine and the common integuments of the external parts —an accuracy of division not always to be attained: whence, perhaps, the difficulty of effecting a permanent cure.

10. That when a permanent cure is effected in these cases, the divided elastic wall of the urethra is not re-united by a structure exactly similar to itself but by common areolar tissue, rendering the part more dilat-

able under the pressure of the stream of urine; the formation of which dilatation can be aided during the progress of the cure by pressing on the divided part with the point of a solid instrument passed daily for the purpose of preventing, if possible, that contraction which always takes place during the process of cicatrization; a proceeding which cannot be advantageously adopted when the parts are divided through the perineum, lest it should encourage the formation of a fistulous opening, to which there is always a tendency.

11. That in cases of intractable stricture accompanied by one or more fistulous openings in the perineum, in *young persons*, or of middle age, the operation through the external parts, or along the urethra, may be resorted to at the pleasure of the surgeon with an equal chance of success, provided the division of the obstruction or bank preventing the free passage of the urine be effectually divided, the *sine quâ non* of the operation.

12. That the operation within the urethra should always be preferred in *elderly* persons, particularly if somewhat stout or fat, as less likely to create severe constitutional disturbance, as shown in Case 15; and if this operation should fail from any cause, it by no means interferes with the due performance of the other through the perineum, which in serious cases then becomes imperative, as the last resource capable of giving relief.—*Lancet, July 7, 1851, p. 617.*

104.—*On a New Method of Applying Caustic in the Treatment of Stricture.*—By JOHN L. MILTON, Esq., London.—[In the present divided state of opinion in the surgical world as to the treatment of stricture, any contribution likely to increase our mastery over it cannot fail to be interesting. The following is a novel and simple mode of applying the caustic.]

The general plan is to direct a small hole to be made with a pin in the extremity of the bougie, and into this is inserted the piece of caustic destined to be applied to the stricture; or else we have armed bougies.

The objections to these are, in addition to those which have made so many surgeons abandon them for the plan of fixing the caustic themselves, that in many cases, especially in the country, armed bougies cannot always be had recourse to, as they are not always to be had when they are wanted, and that they are more expensive.

The plan of cutting a piece of caustic is not free from objections: it is somewhat tedious, and the caustic sometimes projects and comes loose. Not that I believe there is anything to be apprehended from this, unless it be very large, but it alarms both the surgeon and patient, and, in some irritable strictures, produces a very unnecessary amount of spasm and suffering.

The plan I now propose is somewhat similar to Hunter's way of applying caustic to pustules in the eye. The place where the caustic should go being cut flat on the bougie with a knife, and then made a little

rough, a piece of caustic is laid on a sixpence, and fused in the flame of a candle; the rough spot on the bougie is dipped in the fluid, and is instantly coated smoothly with caustic. It is then dipped in the tallow, and twirled gently round till this sets, so that it has a smooth button-shaped sheath of fat. All that is now necessary is to clear the way to the stricture with a large bougie, and then to pass down that which has just been armed. The advantages of this plan are—

1. That we can fix the caustic to any part of any bougie.
2. That we can regulate the quantity with the greatest exactness.
3. That there is no waste; for what is left on the silver cools and hardens, and can be used another time.
4. That the surface is smooth, and does not irritate the urethra.
5. That these bougies are simple, cheap, always attainable, and efficient, and that (the caustic being protected by the fat from the action of the air and moisture) they may be prepared beforehand during leisure moments.—*Medical Gazette, July* 4, 1851, *p.* 43.

105.—PRACTICAL OBSERVATIONS ON THE TREATMENT OF PERMANENT STRICTURE OF THE URETHRA.

By Robert Wade, Esq., Senior Surgeon to the Westminster General Dispensary.

[The following practical remarks upon the treatment of urethral obstructions cannot fail to be of great utility, especially as they are the result of considerable experience in investigating the effects of different curative measures, applicable to such affections. Mr. Wade first enters upon the different modes of treatment. He says]

The means adopted by surgeons for the removal of strictures of the urethra are—1st. Dilatation. 2ndly. The application of caustic. 3rdly. Division of the stricture, either from within, by the lancetted catheter, or from without, by perineal incision. Dilatation is the most simple, and, in my judgment, the best method of proceeding where it is found to answer. It is the one usually adopted, and, when carefully conducted, causes generally but little pain or irritation. Many surgeons have their favourite instruments for effecting dilatation, some giving a preference to the silver catheter, others to the solid metallic sound, whilst the elastic gum, and plaster bougies have also their advocates. When strictures will bear them without much irritation, metallic sounds or catheters, particularly the former, are, I believe, generally the best instruments to employ; indeed, in old hard strictures they are frequently the only efficient dilators. There are, however, many cases where their introduction either causes too much irritation, or cannot be effected, and in which the plaster bougie will be found of great value. The catgut bougie is principally useful in cases of retention of urine. I very rarely use the gum elastic bougie, as its extreme flexibility renders it difficult to know where the point of the instrument is pressing. The conical bougie, which gradually tapers from within an inch or two of its point, has always appeared to me to be objectionable; for, unless of very small

size, should it meet with obstruction in passing along the urethra, it will be almost impossible to know whether the point of the bougie or its increasing diameter, constitute the impediment to its advance. The intervals for the introduction of instruments, as well as the time they should be retained, must be regulated by the degree of irritability of the urethra and bladder in each particular case. Very little attention will be sufficient to instruct the surgeon what length of time it is best to allow an instrument to be retained, as also the proper period for its re-introduction. As a general rule, instruments should not be kept in the urethra less than from five to twenty minutes; and in old hard strictures, I usually let them remain from half an hour to an hour. Mr. Syme tells us that bougies should not be permitted to remain in the urethra more than one or two seconds; as, however, the bougie must be regarded as exerting a mechanical as well as vital action, I do not understand how it will be possible, by its retention for so short a time to accomplish the dilatation of a stricture of any standing. The mere passing a bougie through the obstruction, I believe, will often increase the irritability of a stricture, when the retention of the instrument for a few minutes would have considerably diminished its morbid sensibility. As the treatment of stricture by dilatation is that which is usually adopted, I shall conclude my remarks upon that method by a few summary observations. As a general rule, the more gently and gradually the dilatation is effected the more permanent will be the relief afforded. In the majority of strictures, especially when of long standing, silver catheters, or steel sounds plated, of a proper length and curvature, especially the latter, from their having more solidity than the former, are the best dilating instruments. Dilatation, by retention of catheters,—a treatment which has lately had its advocates,—should, as it appears to me, be employed only in a few cases of a particular character. My reasons for objecting to the general employment of that method are the following:—1st. That rapid dilatation, even when accomplished under the most favourable circumstances, according to my experience, is seldom so satisfactory in its results as when that process is more slowly effected. 2nd. That the prolonged retention of instruments is likely to cause no slight degree of urethral irritation and inflammation, which, in irritable habits, will very probably not be confined to the urethra, but affect the bladder also. To these inconveniences may be added the occasional occurrence of abscess in the prostate, or perineum; and, perhaps, more or less condensation of some portion of the cellular tissue immediately external to the urethra, as well as constitutional disturbance of a more or less serious character. 3rd. This treatment requires strict confinement of the patient to his room, a low diet, and, frequently, a rather free administration of opiates, which, although they may be regarded as mere trifles by the rich and strong, are of no trivial import to him who must live by head or hand; nor are they to those whose vital powers have become depressed by long suffering. There are, however, some advantages to be gained by this plan of treatment; and, in some cases, notwithstanding the risks and inconveniences of the method, it should be adopted. In cases of retention of the urine, where there has been considerable difficulty in the introduction of the catheter, it should be

retained, if practicable, for a period of from twenty-four to forty-eight hours. When there are false passages, and some difficulty is experienced in getting an instrument into the bladder, the treatment by retention of the catheter will often prove of great advantage to the patient. In old, hard strictures, especially when long and irregular, the occasional retention of a catheter for a day or two will sometimes much facilitate their subsequent dilatation. In irritable strictures, when the introduction of instruments is usually succeeded by rigors, Sir B. Brodie recommends this method, having found that retention of a gum catheter, by protecting the irritated lining membrane of the stricture from the contact of the urine effectually prevented the occurrence of rigors. In similar cases I have, however, often succeeded in removing the irritability of the strictures by two or three very mild applications of potassa fusa. In concluding these few imperfect remarks upon dilatation, I must acknowledge that it appears to me almost impossible to prescribe such general rules as are applicable to the infinite varieties of strictures, diversified by individual peculiarities of constitution, and, consequently, requiring some modification in their management. No man can possibly predict precisely what any urethra will bear until he has fairly tried its temper.

With few exceptions, practitioners of the present day, in their treatment of stricture, depend almost entirely upon dilatation, to the exclusion of every other means, from the supposition that it is the only safe method of proceeding. It must surely, however, be admitted, that to be successful in the treatment of any disease the means employed must be adequate to the end in view. Although dilatation, in the hands of a good surgeon, may succeed in the generality of instances, yet it will not do so in all; for cases not unfrequently occur in which other measures must be adopted, or many an unfortunate sufferer from urethral obstruction be left to drag on a miserable existence, and perhaps be eventually destroyed by the giving way of the urethra, and subsequent extravasation of urine. For the relief of such cases, caustic has been proposed and successfully employed by many surgeons of high character. I shall endeavour to place fairly before the Profession the result of my experience upon this method of treatment. It is not from any hastily-formed views upon this subject, from the attainment of success in a few instances, but from more than twenty years' observation of the effects of caustic in bad cases of stricture, that my conclusions have been drawn. The caustic potash has, indeed, proved to me of very great value in the cure of stricture in its most aggravated forms. Various escharotics had been used for the destruction of strictures, by Wiseman and others, long before the time of Hunter. In the following remarks, from Mr. Hunter's 'Treatise on the Venereal Disease,' will be seen the result of his experience of the application of the nitrate of silver to strictures:—"If the obstructions are anywhere between the membranous part of the urethra and glans, where the canal is nearly straight, or can easily be made so, it becomes an easy matter to destroy them by caustic; but if beyond that, it becomes then more difficult; however, at the beginning of the bend of the urethra the obstruction may be so far removed as to admit of the passing of a bougie, or at least to procure a tolerably free passage for the urine. I have seen several cases where it was thought

necessary to follow this practice, and it succeeded so well, that, after a few applications of the caustic, the bougie could be passed,—which is all that is wanted. I look upon the caustic as a much safer method than using pressure with a bougie, on account of the danger of making a new passage without destroying in the least any part of the obstruction." In another passage, Mr. Hunter observes:—"I have often tried this practice in strictures where there were also fistulæ in the urethra, and where the water came through different passages. Such cases are not the most favourable; yet I succeeded in the greater part of them, that is, I overcame the stricture and could pass a bougie freely. I have seen several cases of fistulæ of these parts, where the natural passage was obliterated by the stricture, in which I have succeeded with the caustic, and the fistulous orifices have nearly healed." Sir Everard Home, in his well-known work on Stricture, has strongly advocated the employment of the lunar caustic. He not only used it in aggravated forms of that disease, but indiscriminately in all urethral obstructions, with a boldness and to an extent that frequently caused great suffering, such as rigors, retention of urine, and sometimes profuse hemorrhage. Sir Everard Home's work on Stricture has always appeared to me to be of great value; for, whilst the capabilities of the caustic in removing many bad forms of that disease are proved by a sufficient number of facts to convince all but the ultra-sceptical, its injurious effects are also stated with a candour well worthy of imitation. That the treatment by caustic was frequently adopted by Sir Everard in cases where the employment of milder measures would have been more judicious, and that it was pushed by him occasionally to an injurious extent, cannot be denied. That his recommendation of the employment of the nitrate of silver in all cases of permanent stricture, led, in many instances, to a fearful abuse of the remedy in the hands of others, must also be admitted. Mankind generally are apt to entertain extreme views, and because rigors, false passages, and sometimes debilitating hemorrhages were found to result from the caustic treatment, or rather its abuse, a really valuable means of cure in many intractable cases of stricture was soon abandoned by the generality of surgeons. After the ample evidence of the powers of the nitrate of silver in removing many strictures that had remained impermeable to the bougie, recorded by Hunter, whose truthfulness and accuracy of observation are unquestionable, besides the great number of cases of a similar character mentioned by Sir Everard, one would imagine that the *capability* of caustic to destroy many obstinate forms of urethral obstruction could scarcely be questioned by any rational being.

I shall now proceed to the consideration of the employment of potassa fusa in stricture, the only caustic besides the nitrate of silver at present used in that disease. To Mr. Whately must be ascribed the merit of having been the first to use the potassa fusa in stricture of the urethra, and of having done all in his power to make the public acquainted with its curative powers in that disease. From some cause or other, notwithstanding the strong recommendation of Mr. Whately, this truly valuable caustic has been less generally employed in urethral obstructions than the nitrate of silver. Before giving the result of my own observations regarding the efficacy of the potassa fusa in stricture, it is but right to

state those of Mr. Whately. In his work, entitled, 'An Improved Method of Treating Strictures in the Urethra,' we have the following remarks:—"In every stricture, before we apply the potassa fusa, we ought to be able to pass a bougie into the bladder of at least a size larger than the finest kind. This is necessary, to enable us to apply the caustic to the whole surface of the stricture, and likewise to put it into our power to remove a suppression of urine, should it occur during the use of the caustic. Put a small quantity of kali purum upon a piece of strong paper, and break it with a hammer into pieces, about the size of large and small pins' heads. Thus broken, it should be kept for use in a vial closed with a ground stopper. A small hole, about the sixteenth part of an inch deep should be made at the extremity of the bougie, which should be just large enough to enter the stricture. A large blanket pin, 2½ inches in length, with the head struck off, will answer the purpose, the hole being made with the point of the pin. Some of the broken caustic should then be put upon a piece of writing paper, and a piece less than half the size of the smallest pin's head should be selected, the particle cannot be too small for the first application. Let this be inserted into the hole of the bougie, and pushed down into it with the blunt end of a pin, so as to sink the caustic a very little below the margin of the hole. To prevent the kali from coming out, the hole should be contracted a little with the finger, and the remaining vacancy in it filled up with hog's lard. When the bougie has reached the anterior part of the stricture, it should rest there for a few seconds, that the caustic may begin to dissolve. It should then be pushed very gently about one-eighth of an inch, after which there should be another pause for a second or two. The bougie should then be carried forwards in the same gentle manner till it has got through the stricture. When the caustic bougie has passed through a stricture, it should be withdrawn to the part at which it was first made to rest. After which it should be passed very slowly through the stricture a second time. If the patient complain of pain, the bougie should be immediately withdrawn; but if not, we may repeat the operation by passing and withdrawing the bougie through the stricture once or twice more, which will take up, in the whole, about two minutes. It is essential that the bougie pass through the stricture at each application of the caustic. We ought, therefore, to pass the bougie we intend to use once through the stricture before the kali is inserted into it. At the end of seven days, the application may be repeated; and if the patient felt no degree of pain, a piece of kali a small degree larger than the first may be selected. The operation should be repeated till the contracted part of the urethra is dilated, if possible, to the natural size. We are, however, on no account to increase the quantity of caustic as we increase the size of the bougie. I do not in any case apply more of the kali purum at a time than a piece about the size of a common pin's head. Twelve bits of the largest size weigh one grain. I have in a few cases re-applied the caustic at the end of five days. There are some cases in which the contraction is so irregular, and its aperture so untowardly situate, that a bougie cannot readily, if at all be passed into it; others have likewise been described, in which it is impossible to pass a bougie through the strictures. If, in the former of

these cases, a bougie with the kali cannot be passed into the stricture, or if it get through the stricture and yet do not destroy the irregularity, and it becomes necessary to apply a caustic to the anterior part of the contraction, I should certainly prefer the lunar caustic to the kali purum." From the result of no inconsiderable experience of the use of potassa fusa in many intractable forms of urethral obstructions which had resisted the ordinary means of treatment, I am convinced that the excellent effects of this caustic in the cure of stricture are but little known to the generality of surgeons. It was in impermeable strictures that I first had recourse to caustic potass, and very soon became convinced of its superiority to nitrate of silver in such cases. I found that to be effective in old, hard strictures, it was necessary to employ it much more freely than was recommended by Whately, and that this might be done with perfect safety. The caustic potash may be advantageously applied to strictures for two purposes: one to allay irritation; the other, to destroy the thickened tissue which forms the obstruction. When used in the minute quantity employed by Mr. Whately, I believe its action to be simply that of allaying irritation, as, when mixed with lard and oil, combined with the mucus of the urethra, it can scarcely have any effect beyond a mild solution of caustic which most probably causes a more healthy state of the lining membrane of the stricture. To insure the action of the potass, instead of being below the level of the hole of the bougie, it should be fairly exposed, having its points slightly projecting. The bougie should be marked as directed by Mr. Whately; and if the points of the caustic be covered with lard, there need be no fear of its acting before it reaches the stricture. When used in small quantity, of the size of a common pin's head, (and less is seldom of any use,) unless a stricture be very irritable, its application usually causes nothing more than a slight sensation of heat, scarcely amounting to pain. The bougie should be gently pressed against the stricture for a minute or two if impermeable, and then withdrawn. When the caustic is applied to permeable obstructions, the bougie should be passed three or four times over the whole surface of the stricture. To impermeable strictures the caustic should be applied with greater caution than to such as are permeable; for should retention of urine occur, it will be more easily relieved in the latter than the former. It usually happens that after one or two applications of the caustic, the bougie will be found to enter the obstruction. Before applying potassa fusa to impermeable strictures, every precaution should be used to guard against irritation. If convenient, the application may be made at bed-time; and should the patient have been subject to rigors or retention of urine, it will be best to administer an opiate injection about an hour before the operation.

Contrary to what is generally supposed, potassa fusa, from its forming with oil and mucus a slimy saponaceous compound, admits of being more easily confined to the strictured portion of the urethra than the watery solution caused by the application of the nitrate of silver. This is one advantage in favour of the caustic alkali. Another, arising from this miscibility with oily substances is, that its action can be better regulated than that of the nitrate. It may be either used as a mild stimulant or as a powerful caustic. It appears to me, however, that the

principal superiority of this caustic to the nitrate of silver, in the treatment of stricture, consists in its more powerful effect in removing hard strictures, and that, with perfect safety, and comparatively with but little pain. It has been previously stated that, when used for the destruction of hard, gristly strictures it must be more freely applied than recommended by Whately; but the quantity should be very gradually increased, and regulated according to its effects. Some of the accidents caused by the nitrate of silver, when used for the destruction of strictures, have arisen either from the slough which it produced having so completely obstructed the previously contracted channel as to cause retention of urine; or, on its separation, hemorrhage to a considerable amount. From the tendency of the nitrate of silver to produce adhesive inflammation, it is probable that the coagulable lymph, caused by its free application, may form no slight barrier to its destructive effects. This tendency, I think, may in some degree account for the great number of applications of this caustic which were required in some of Sir Everard Home's cases.—*Med. Times, May*, 24, 1851, *p.* 557.

106.—*On the Use of Twisted Bougies in Stricture of the Urethra.* M. Leroy D'Etioles addressed a letter to the Academy of Medicine in which he submitted a series of facts to show the advantages of the employment of bougies twisted spirally, in overcoming certain irregular strictures of the urethra that have resisted the ordinary instruments. The cases cited were fifty-three in number, and had all been witnessed by medical men. M. Leroy D'Etioles stated that it is not requisite that the instruments should be made specially for the purpose: it is only necessary to twist a small common gutta percha bougie twice or thrice round a large pin or wire, and letting it remain for a few minutes, when the spiral twist will have become permanent. The bougie thus formed follows the sinuosities of the stricture, but requires some skill and patience in its use.—*Med. Gazette, July* 4, 1851, *p.* 42.

107.—*On a Case of Calculus of the Urethra and Prostate Gland, with Obstinate Stricture of the Urethra.*—By Dr. Benjamin Barkus, Gateshead, Newcastle-on-Tyne.—[This was the case of a joiner, aged 57, married, of intemperate habits, and in his youth having had gonorrhœa frequently. Has suffered from difficulty of making water for thirty years, but eighteen months ago was seized, with retention of urine, followed by extravasation into the scrotum and perineum. No catheter could be passed. On the 19th of Feb., 1851, he laboured under another attack of retention and extravasation into the cellular tissue of the scrotum. Free incisions were made, and the urine passed by the openings. The sloughing of the scrotum was extensive, almost exposing the left testicle. No instrument could be passed into the bladder.]

On March 2nd, whilst endeavouring to pass a small-sized catheter, it came in contact with a calculus anterior to the bulb. An incision was

made down upon it, at the junction of the scrotum and perineum, which latter was densely hard, and almost cartilaginous in its whole length. A calculus, of the size of a filbert-nut, was extracted, giving considerable relief. From this time the man's general health improved, yet it was found impossible to pass a catheter beyond the bulb, where the instrument seemed to be resisted by a dense, unyielding contraction; in fact, the urethra appeared to be obliterated. It was now resolved to make a passage to the bladder, of sufficient size to admit a full sized catheter, if possible. With the assistance of my friends, Messrs. Pearce and Gibb, I performed the operation on the 13th of March, eleven days after the first operation. He was placed in the position for lithotomy, and, after having been rendered insensible by chloroform, a catheter was introduced as far as the bulb of the urethra, and an incision made down to the point of the instrument; with the aid of a director and the catheter, gradually advanced, the incision was carried to the prostate gland, where the instrument came in contact with another calculus, which occupied almost the whole of the prostate. An incision was then carried through the lower part of the prostate, and a stone about the size of a large filbert-nut extracted, and the catheter now glided into the bladder. From this time the man has gone on well; the catheter was at first allowed to remain in about a week, but it is now only introduced occasionally for a few hours in the day. The external wound is almost healed, and very little urine flows from it.

April 8th.—The urine flows in a full stream from the urethra, and the man's general health is better than it has been for several months.

This operation may be considered as a modification of that advocated by Professor Syme, for the cure of stricture. With the learned Professor, it is a *sine quâ non* that a grooved staff be passed into the bladder. In this case all efforts of myself and friends to pass an instrument proved fruitless. Probably Professor Syme might have succeeded, as he scarcely admits having failed to pass an instrument in every case that has come under his care.—*Lancet, July* 12, 1851, *p.* 30.

108.—CASE OF STONE IN THE BLADDER—LITHOTRITY AND CURE.

Under the care of Mr. Barnard Holt, Westminster Hospital.

[In employing the operation of lithotrity, it is of the utmost importance that the greatest care should be taken in the discrimination of patients.]

A satisfactory state of the general health, a pretty sound condition of the bladder, and a moderate-sized stone, are requisites without which it is somewhat hazardous to undertake lithotrity; and though much is left to the discretion and discrimination of the surgeon, there are certain rules which must not be infringed. It is, however, clear that complications may occur with lithotrity, as with other operations, which the shrewdest cannot foresee, and which will baffle the most legitimate hopes and best directed skill. It would seem, however, that success is much influenced

by the more or less ready manner with which the stone is seized and crushed; and though this part of the proceedings may, to the bystanders, appear of easy accomplishment, experienced surgeons know that a good deal of habit and dexterity is indispensable, not only for seizing and crushing, but likewise for the use of the scoop.

[A healthy countryman, about 65 years of age, was admitted April 14th, suffering from stone in the bladder. Five months previous to admission, he had been apparently attacked with inflammation of the kidneys, great pain being experienced in the back, and subsequently along the course of the right ureter. This pain in a short time was suddenly relieved. In three weeks after he complained of pain at the end of the penis, and likewise that his urine was occasionally tinged with blood.]

One day after the patient's admission, Mr. Holt passed a sound, but was unable to detect any calculus. The man was ordered a dessert-spoonful of castor-oil every morning, and barley-water for beverage. Upon introducing the sound two days afterwards, Mr. Holt directly detected the stone, which appeared to be small and soft. The patient was kept in bed; he continued the castor-oil and barley-water, and was allowed some beef-tea.

On the fourth day after admission, the bowels having been freely relieved, the urine being copious, and the bladder not irritable, Mr. Holt injected this viscus, introduced the lithotrite, and readily caught the stone. The latter was small, very fragile, and easily broken by the slightest pressure of the screw. The crushing was repeated five or six times, without the patient complaining of the slightest pain, and every portion was apparently reduced into minute fragments. Upon passing water immediately afterwards, the patient evacuated readily a considerable quantity of dust, of the lithic acid character. He was desired to keep in bed, drink plentifully of barley-water, and to take five grains of Dover's powder, suspended in mucilage and water, every fourth hour.

For the first three days after the operation, the patient progressed very favourably, and passed moderate sized fragments with each evacuation of the bladder. On the fifth day, no more detritus having been rejected, Mr. Holt introduced the scoop, and easily removed several pieces, without any pain to the patient. From this time to the tenth day no unpleasant symptom arose; but the scoop was once more used, in order thoroughly to ascertain whether any pieces were left. Two fragments were detected, and readily brought away. Seven days afterwards, the scoop failed to detect any more fragments, and the patient, having remained perfectly well up to the twenty-second day after the operation, was discharged. On his leaving the hospital, he passed urine only three times a day, was not compelled to get up in the night, was perfectly free from pain, and able to take any amount of exercise.

Mr. Holt remarked that in all the cases in which he had operated, he never met with one more peculiarly adapted to the operation of lithotripsy then the present: the capacious bladder and urethra, the small size and fragile nature of the stone, and excellent health of the patient, all offering the best chance of a speedy and successful termination. In this instance, *one* operation was found sufficient, the after introduction

of the scoop having been had recourse to for the purpose of facilitating the removal of fragments, the non-irritable condition of the bladder being very favourable to its introduction.

It will be seen that Mr. Holt did not use the lithotrite as a sound, as he considered it much better, after having been once satisfied of the existence of a foreign body, to introduce the lithotrite, depress the lower blade, and thus form a pouch of the posterior wall of the bladder, into which the stone readily fell. Indeed, in subsequently searching for fragments, if they are small, it is almost impossible to detect them in any other way. It is, in fact, in the majority of instances, useless to introduce a sound for the purpose of detecting any fragment that may be detained in the bladder; it is much better to inject the viscus and introduce the scoop, going through the same steps as if the stone were unbroken. By depressing the posterior wall of the bladder, if there be a fragment, it is almost sure to fall between the blades of the scoop; whereas, if only searched for with the sound, the fragment may not be reached, from its probable detention by a fold of mucous membrane or its lying behind the prostate gland.

With regard to the exhibition of opium after the operation, Mr. Holt considers that it tends in a very great measure to prevent the rigors which so frequently supervene in lithotrity. In some instances a severe shivering fit will be experienced after the first, but not after any subsequent operation, unless a larger instrument be used than the urethra will conveniently bear.—*Lancet, Aug.* 2, 1851, *p.* 106.

109.—ON THE DECOMPOSITION OF PHOSPHATIC CALCULI BY SOLUTIONS OF LEAD.

By Dr. S. Elliott Hoskins, F.R.S., &c.

[From cases which have occurred under his notice, Dr. Hoskins says, that not only does the bladder, under irritation, tolerate the presence of solutions of lead, but also that they act as sedatives, and exert a favourable influence, directly and indirectly, on the morbid secretion of mucus which generally, in such cases, exists. Dr. Hoskins proceeds:]

After having made trial of most of the vegetable supersalts of lead, all of which act, more or less, as unirritating decomponents, I have returned to the use of that originally proposed, the nitro-saccharate, as by far the most effective. That prepared for me by Mr. Garden, of Oxford Street, is much more energetic as a chemical agent than my own, and equally mild in its physiological effects. It is likewise more decidedly an organic salt, which I consider essential to the fulfilment of the ends in view; and I am strengthened in the opinion that sugar is a necessary ingredient, from the perusal of two papers in the July number of the 'Pharmaceutical Journal'; one by M. E. Peligot, on the 'Combinations of Sugar with Lime,' and another by M. Barreswill, on the 'Solution of Carbonate of Lime in the Saccharates.'

One grain of the salt, superacidulated with five drops of strong acetic acid, is the proper proportion for admixture with each fluid ounce

of water. It is essential that the salt and the acid should be incorporated before the addition of the water, and that the whole should be brought to the boiling point. Superacidulation is necessary on many accounts; it secures perfect solution, increases the decomposing activity of the liquid, and prevents the formation of any carbonate of lead.

As the salts contained in the urine tend to decompose the solution, and lessen its effects on the concretion, the bladder should be evacuated, and washed out with tepid water before the lead fluid is introduced. A double-current caoutchouc catheter is the best for this purpose, as it enables a continuous stream to be employed; and as, on account of its flexibility, it is less liable to irritate the urethra, which should be sedulously avoided. From four to eight fluid ounces of the solution may be thrown into the bladder at a time, and renewed every ten or fifteen minutes, as often as may be deemed proper. By renewing the liquid at short intervals, much greater effect on the calculus is ensured, than when it is allowed to remain longer; for the precipitate formed by decomposition soon envelopes the stone, and puts a stop to further action, until a fresh surface is exposed. Exercise during the retention of the injection increases its effect. Some slight revulsion may be produced by the first introduction of this, or any other fluid, into the bladder; when such is the case, the operation should be remitted for a day or two, and cautiously renewed. The injection may be either warm or cold, as may be most agreeable to the sensations of the patient. Warmth favours the decomposition of the calculus.

If used with proper precautions, I have found that the lead solutions exert as sedative and salutary an influence on the lining membrane of the bladder, as they do on external surfaces under inflammation. They also act upon the mucus, which is so abundantly formed in cases of this nature, coagulating it into short curdy flakes, which are easily passed through the urethra.

When the urethra itself is inflamed, or abraded, the injection will be injurious; for the lining membrane of the canal is, I believe, more sensitive than that of the bladder. The introduction therefore of decomponents should be had recourse to, either before lithotrity, or after the urethra has recovered from the effects of the instruments employed, but can never be used, with any prospect of success, where organic disease of the bladder or prostate exists. The injection should not be employed during the internal exhibition of hydrochloric acid, although it may be freely used when nitric acid is administered. When the bladder is not very irritable, a dilute nitric acid injection, alternating with the lead solution, will hasten decomposition.

The two facts established with respect to the lead salts, viz., first, their toleration by the bladder; and, secondly, their chemical action on calculous concretions, induce me to hope that they may become useful agents in the treatment of various other affections of the urinary organs. I have never presumed to imagine they would prove specific solvents for the stone; but, I trust that, where surgical operation is inadmissible, they will be of some avail for relief, if not for cure, by smoothing asperities, and removing the outward phosphatic coating of calculi, so as to bring them within the verge of the crushing forceps; in short, that they

may avail for partial, if not for entire disintegration. The latter is more likely to happen where layers, composed of the urates or oxalates, are bound together by phosphatic cement. On this species of calculus, they are calculated to act as highly carbonated waters do on those of another description.

"Nor is the action of highly carbonated waters," says Dr. Prout, "confined to their mere solvent effects; they undoubtedly possess disintegrating power; that is, the power of disturbing the attraction, both cohesive and adhesive, by which the molecules of the calculi are held together, so as to render them brittle and easily broken into fragments." This is an additional reason for using decomponents before recourse is had to lithotrity.

Besides the kind of cases already adduced, there is one variety for which decomponents seem to be peculiarly adapted; viz., concretions in the prostate gland. No instrument hitherto devised has been successful in dislodging them. The first case, however, mentioned in the present paper, goes to prove that a considerable quantity of calcareous matter was removed from the prostatic portion of the urethra, by the use of the lead injection.

In the first experiment communicated to the Royal Society, it was stated, that one hundred grains of calculus immersed in lead solution for forty minutes, had lost twelve grains. In the second experiment, the quantity dissolved, from a fragment weighing thirty-seven grains, was, after half an hour's immersion, eight grains. Subsequent experience has verified these observations, and proves that, under favourable circumstances, decomposition takes place in definite proportions; so that, from the precipitate of phosphate of lead, the quantity of ammonio-magnesian phosphate which has been decomposed may be securely estimated.

Since these circumstances obtain out of the bladder, by means of a fluid which can be borne by that organ with impunity, we may reasonably hope, that the mere transference of the scene of action, from the exterior to the interior, will not materially affect the results.—*London Journal of Medicine, October,* 1851, *p.* 890.

110.—*Acute and Chronic Inflammation of the Bladder.*—Mr. Acton's descriptions and opinions precisely coincide with, indeed, are largely taken from, those of the most established writers, and therefore we need not particularise them.

In obstinate cases of chronic cystitis, he however, adopts a method of cure which is certainly not common. "Provided these means fail, and unfortunately failures are not uncommon, we must have recourse to the following plan of injecting the bladder with nitrate of silver. To effect this, I pass a gum elastic catheter into the bladder, and draw off the urine, and, then, with a glass syringe, which fits accurately to the instrument, I inject the whole of the following solution into the viscus: ℞. Argent. nitrat. ʒij; aquæ destill. ℥iv; M. ft. inject. The immediate consequences are, increased pain, which for the moment is

very severe, the urine that is first passed is bloody, and some tenesmus is experienced. In a short time, however, these symptoms abate on the patient keeping his bed, and paying great attention to his diet; at first no liquids should be taken, nor for the first few hours preceding the operation; subsequently the usual quantity of tea or barley-water may be indulged in, and the various balsams, particularly turpentine or spruce, should be prescribed. In a very few days the urine will contain less of this ropy mucus, and ultimately none will be noticed; in other cases, the injection may again be resorted to at the end of four or five days, and repeated until a complete cure is effected. We rarely or ever observe any of the ill consequences which probably might be expected to arise when injections are thrown into this important organ.—*London Journal of Medicine, July*, 1851, *p.* 650.

111.—VARICOCELE TREATED BY THE NEEDLES AND THE TWISTED SUTURE.

Under the care of Mr. Fergusson.

[It seems pretty well understood that all cases of varicocele do not require operative interference. Proper and well regulated support generally affording sufficient relief where the affection is not of a severe description. The distended veins of the cord, however, may cause such painful dragging and disturbance of the general health, as to call for some remedial means. M. Boyer advises an incision to be made over the external ring, to lay open the fibrous sheath of the spermatic cord, and to tie everything contained in it but the vas deferens and the artery. Though hazardous, the author prefers this method to the ligature as advised by M. Ricord, cauterization, or to the rolling up of the varicose plexus, as advocated by M. Vidal. The following case will illustrate Mr. Fergusson's plan. W. J—, aged 28, admitted March 13, has had an aching pain in the scrotum for the last eight or nine years. The veins on the left side are much enlarged and turgid, with dragging pain in the cord, and severe aching in the back and loins. He has been wearing a suspensory bandage for the last two years.]

On the 15th of March, Mr. Fergusson passed three needles under the scrotal veins, and twisted strong silk round them, as in the hare-lip operation. Two days afterwards the inflammation was rather severe in the scrotum, but the patient only complained of heat in the part, and of a little cough. On the eighth day, the needles ulcerated out, and no pain or tenderness of the cord was complained of. On the seventeenth day, Mr. Fergusson removed the needles, which were very nearly out. On the twenty-second day, the sores left by the needles were rapidly healing, and the patient was soon discharged, free from the very inconvenient affection for which he had been operated on.

The mode of operating illustrated by this case combines many advantages, and does not seem, while it effectually obliterates the veins, to inflict such violence upon the vessels as is done by a method newly introduced at Paris by M. Vidal, Surgeon to the Hôpital du Midi.

This latter method consists in passing a silver wire, held by a needle, behind the veins of the cord, these vessels and the vans deferens having first been separated. Another silver wire is then introduced in front of the vessels, this second wire running through the same apertures as the first. The veins are thus situated between the wires, the ends of which are loose on either side, and the latter are now twisted upon themselves. This torsion acts at first only on the wires, the latter forming a loop which becomes gradually diminished in size, and contains the veins. This first twisting movement tends to reduce the veins to a mere cord, and the wires to a metallic string offering a certain amount of resistance. This metallic string, in turning upon its own axis, must evidently carry with it the parts contained within the two wires of which it is composed, and the veins are thus rolled upon this double metallic cord as the rope turns on the winch.

The vas deferens is not included in these displacements; it remains untouched behind the wires, and the testicle is carried upwards towards the abdomen, where the veins have a fixed point; and the more turns are made the higher the testicle is drawn. A small roller is then placed on the skin which separates the apertures of entrance and exit of the wires; the latter are twisted upon the roller, and a probe being passed under it, the parts are still more compressed by means of this kind of packing-stick. The author states that this operative proceeding is divided into three parts: 1, rolling of the veins on the wires; 2, compression of those vessels which are both between and before the threads; 3, section of the veins at various points of their length; in fact, in as many points as turns have been made.—*Lancet, June 7*, 1851, *p.* 622.

112.—ON HYDROCELE.

By Bransby B. Cooper, Esq. F.R.S., &c.

The operations which have been introduced into surgery for the purpose of effecting a radical cure of hydrocele are numerous and varied, and all, in turn, have met with support from some and opposition from others. Since I have employed injections with the tinctura iodinii composita, I have never had occasion to resort to other means, nor have I ever observed any ill effects accrue from its use. I have now used it in about thirty cases, and in all, without exception, successfully—in cases, too, where other remedies had proved ineffectual. Port wine, sulphate of zinc, and many other agents, have been advocated as injections, but none act so safely and efficiently as the compound tincture of iodine, and none are attended with less pain and inconvenience to the patient. It is on this account that I now always employ it in preference to anything else, and strongly recommend you to do the same, if you wish to insure success in the radical treatment of hydrocele. The plan I always follow, is to puncture with a trocar and cannula, to withdraw the fluid and inject into the tunica vaginalis ʒ ij. of a mixture of one part of tr. iod. co to three of water, which is allowed to remain. The simple tincture or alcoholic solution of iodine, is not fit for injection, as

the addition of water causes the immediate deposition of the greater portion of the iodine in a pulverulent form. This is obviated in the compound tincture by the iodide of potassium it also contains preventing such an occurrence. The operation is usually followed by a more or less severe smarting pain, which rarely lasts more than a few hours. An inflammatory action is thus set up in the membrane and is succeeded with a considerable effusion, causing a re-appearance of the hydrocele, which, however, in the course of three or four weeks. or often much earlier, entirely subsides. If the inflammation be excessive, the patient should be made to keep his bed, and such antiphlogistic means be resorted to as will moderate and subdue it; if, on the other hand, it be thought insufficient to destroy the secreting surface of the membrane—the object intended by the operation—he should be made to get up, and walk about, which will soon produce the desired effect.

There are certain unfavourable circumstances which may arise in the performance of the operation which you should be made aware of, and which you should take special care to avoid: such are puncturing the testicle, injecting the cellular tissue of the scrotum, or injecting the peritoneum. Puncturing the testicle, I believe always to arise from carelessness and negligence, in not ascertaining its exact position. It should be remembered that in a hydrocele which has been once tapped the testicle will be found adherent to the cicatrix; such a position, therefore, must consequently be avoided in re-tapping. Injecting the cellular tissue: I have known an instance of this occur where wine was the agent employed; it was followed by extensive sloughing of the scrotum, and ultimately led to a fatal termination. The possibility of the occurrence of such an accident is much less likely from the use of compound tincture of iodine than anything else, as so small a quantity is requisite for the purpose. Simple, therefore, as you may have considered this operation, if due care and precaution be not exercised on the part of the operator, it may lead to the most serious, and even, as we have seen, to fatal consequences.

In a case of double hydrocele—hydrocele of the tunica vaginalis of each side, a question might be raised of the propriety of tapping and injecting both, either at the same time or the one shortly after the other. From an instance which occurred to me a short time since, I should now decidedly only inject one, with the impression that this single operation might lead to the cure of both. The case to which I refer was admitted into our clinical ward a few months ago, and may probably be remembered by many present. He was in Luke ward, and had hydrocele on both sides, but one was considerably larger than the other; the largest I tapped and injected, and in about a fortnight or three weeks afterwards he was sufficiently well to leave the hospital. I have since heard of him, and both hydroceles have entirely disappeared.

The other operations, as incision, excision, caustic, seton, and tent, employed for the radical cure of hydrocele, I have already told you I do not now resort to myself, and do not recommend you to do so.—*Med. Times, July* 5, 1851, *p.* 6.

113.—ON THE TREATMENT OF VARICOCELE.

By Dr. James Morton, Fellow of the Faculty of Physicians and Surgeons of Glasgow.

[The first incentive to lead Dr. Morton to the consideration of the treatment of varicocele, was the remark in Mr. Curling's valuable work on the testis, that varicocele is almost an incurable disease. Subsequent inquiries, however, have satisfied Dr. Morton that the time is approaching for such a reproach against modern surgery to be removed. He remarks:]

When considering the means of palliating this disease, it is necessary to keep constantly in view the anatomical peculiarities of the parts more immediately implicated, such as the origin and course of the arteries and veins, the direction of the excreting ducts, and the media of support to the organ or organs, in this instance the scrotum and cremaster muscle; and also the positions which the contiguous parts occupy in relation to these, and the mechanical or vital effect, if any, which they may exercise upon them. When the circulating system is the seat of disease, as in this lesion, the course of the vessels supplying the parts with blood, and also that of the venous return, which are usually nearly the same, demand most careful attention; and from a consideration of the course of the spermatic vessels, it is obvious that any circumstance which may tend to produce an accumulation of venous blood in the right side of the heart and vena cava, would predispose to congestion, especially of those organs from which the blood has to return in opposition to the law of gravity; hence, everything which may cause or continue such accumulations ought to be avoided, or, if possible, removed. Everything which of itself causes determination of blood to the testes and scrotum should be shunned, such as warm baths, fatiguing exercise, much indulgence in venery, &c. Gentle aperients, or warm-water enemata, should be employed to obviate costiveness, which always aggravates the malady. A light, loose dress should be worn; the cold-shower bath may be used, as well as frequently dashing the parts with cold water; the cold plunge-bath proved very serviceable as an adjuvant in the case about to be detailed; the parts should be supported by a suspensory bandage, in order to diminish the length of the vessels, and, consequently, the height and weight of the volume of blood circulating too slowly within them; the bandage should be formed of open silk net, so as not to heat the parts, and to admit of the use of an evaporating lotion at the same time.

Various plans have been proposed in order to make the scrotum itself serve the purpose of a suspensory bandage: such as Mr. Wormauld's, and the operations proposed by Sir A. Cooper and Dr. Lehmann, a German surgeon, all fully described by Mr. Curling in the work already alluded to. Of the various operations proposed or performed upon the veins, I shall merely enumerate the following:—division of these vessels, by Sir B. Brodie; ligature of the same performed by Sir E. Home and Delpech; M. Davat's plan, a sort of twisted suture; M. Vidal's plan of silver wires, twisted subcutaneously; the red-hot wires as used by Liston; M. Ricord's plan, a form of subcutaneous ligature; and a modification of this, proposed by Mr. Luke; excision of the veins, as practised

by Petit and others; and, finally, Breschet's plan of obliterative compression by the forceps. All these (with the exception of the plans of M. Vidal and Mr. Liston, which are not noticed by him) are characterized by Mr. Curling either as ineffectual in removing the disease, or as dangerous both to the integrity of the testicle and the life of the patient: producing atrophy of the former, and endangering the latter by hemorrhage, severe constitutional disturbance, phlebitis, and sloughing of the parts. In severity all these operations are altogether unjustifiable, more especially when we find that another mode of cure has been suggested, which is free from all the dangers above alluded to, is attended with little or no inconvenience in its application, and, when carefully and perseveringly applied, seems to be almost uniformly successful. In proof of this, cases have already been published, and to these I would take the liberty of adding the following.

[Dr. Morton records a case, arising from the effects of a very smart kick upon the scrotum, of a boy, about 14 years old. Although all the symptoms disappeared after a few days, yet a knottiness in the vessels, with an occasional sense of uneasiness or feeling of weakness in the part remained. This state of things, however, gradually became worse, until, at the age of 27, it was necessary something should be done for his relief. The use of a lever-spring truss was suggested, Dr. L. Thomson, of Dalkeith, having been the first to draw attention to this method of treatment, in a paper published in the 'Monthly Journal of Medical Science,' for November, 1848.]

Dr. Thomson very kindly showed me the mode of applying the lever-spring truss. I at once fitted a similar instrument on my patient, and its immediate effect was such as to inspire him with hope and confidence in at least the palliative powers of the remedy. When applied after the patient had been in the recumbent posture and the tortuous veins had emptied themselves, the power which it seemed to possess in preventing their refilling and distention, was to me a matter of surprise, and, I must confess, rather unexpected. On the 9th of January, he first commenced to wear it regularly, but as I was not with him when the truss which had been specially made for him arrived, my patient, being afraid to lose any time, applied it himself as well as he could, and when I saw him two days afterwards, there was a little irritation and swelling of the cutaneous tissues over the pubis and rather below than upon the external ring, where the truss ought to be worn. The impression on his mind seemed to be, that the nearer it could be worn to the tortuous and enlarged veins, the better.

The instrument being properly adjusted, all pain and swelling speedily disappeared, the parts became accustomed to the pressure of the pad, and the veins gradually diminished in size and apparent tortuosity. Notwithstanding the progressive improvement in the condition of the veins, and the assiduous application of cold lotions to the part, the scrotum continued very lax and pendulous on the left side, generally hanging an inch and a half, or even two inches, lower than the testicle; so much was this the case, that at one time I was considering the propriety of having recourse to some operative procedure, such as Sir A. Cooper's

operation, or that of Breschet or Lehmann, when it occurred to me that the cold plunge-bath would prove a more efficient bracing agent than the mere local application of a cold lotion, and, besides, I was desirous of testing the contractile powers of the scrotum a little further.

About two months, then, after the first application of the truss, the patient commenced the use of the cold plunge-bath every day, or every second day, as he had opportunity, and by the end of two months more the parts had much improved. It may here be remarked, that the local cold bathing had little effect upon the contractile powers of the scrotum, and that little was very transient, only lasting a few minutes, while the cold plunge-bath produced much greater contraction, which did not entirely disappear for at first two, and afterwards three or four hours after the bath. Under this treatment the improvement of the parts, and, of course, of the patient's feelings, has been all that could be wished, so much so, that he has since married. He still wears the truss.

In the month of September, 1850, I wrote to Dr. Thomson, informing him of the result of this case, and requesting that he would favour me with a detail of his experience in such cases, subsequently to the publication of the paper already referred to. In reply, he wrote as follows:—

"You ask me to favour you with some remarks on my further experience of the pressure plan of cure since I published on the subject. At present I am unable to give you any detailed statement, but I may mention that, after further trials, I continue, with very slight alterations, to entertain the favourable opinions I then expressed. I have received seven or eight letters, similar to your own, from parties at a distance, who have spoken in the same glowing terms of the relief that has been afforded them by the use of the instrument I recommend. I am only able to lay my hand upon three of these documents at the present moment. The writer of one of them, a perfect martyr to the depressing effects of varicocele, was led to apply to me by the merest accident; namely, by seeing some allusion to my paper in one of the half-yearly Medical Abstracts which he happened to take up, to amuse himself, in his medical attendant's house.* He applied to me in June, 1849, when the varicocele, which he thought had been caused by a '*crush*,' had been of four years' standing."

[The patient afterwards wrote to Dr. Thomson, stating, that although great inconvenience and pain resulted at first from the employment of the instrument, yet that now the parts were assuming a natural healthy feel and appearance,—and, he believed, that in the time specified, nine or ten months, a complete cure would be established. Dr. Thomson goes on to say]

"With the exception of one case, I am not sure whether the truss has altogether been discontinued in any, for, as soon as complete relief is experienced, I hear nothing more from my patients. This is partly owing to my own negligence in correspondence, but more, perhaps, owing to the reluctance patients have in giving up the use of that which has been of so much service to them. For some time after discontinuing the use

* See 'Retrospect,' vol. xviii, p. 250.

of the truss there is felt the want of its *support*, which, in those who have to undergo much muscular exertion, is apt to make them take to it again, though in reality not requiring it. I find, however, that even in a young subject, considerably longer than nine or ten months may be necessary to produce a radical cure."

It must be admitted that the proposal of applying a truss in cases of varicocele is opposed to our preconceived notions; taught as we have been, in works on hernia, carefully to distinguish between protrusion of the bowel and dilatation of the spermatic veins; and, on no account, to think of applying a truss to the latter class of cases; such a precedure being calculated to result only in a mischievous aggravation of the disease. But against these notions we have here the stern verdict of experience, and we are constrained to look around for some principle by which to explain the *modus operandi* of the agent we employ.

It is by a process of analogical reasoning that we have arrived at a knowledge of this method of treatment, for the history of which, and an account of the principle upon which it is founded, I must refer to the work of Mr. Curling. The merit of suggesting the application of pressure to varicocele seems to belong to the late Mr. Aston Key. The object of it may be stated to be the maintenance, while the patient is in the upright position, of pressure upon the spermatic veins, to such a degree as may be sufficient to relieve them from the superincumbent weight of the blood, without endangering the integrity of the testis by obstructing the spermatic artery, or becoming unbearable by the patient. This pressure must be continued for a time sufficient to allow the coats of the veins to return to their natural dimensions, or nearly so, and until they acquire strength to carry on the circulation. It may be supposed, that the valves incompetent for the dilated canal may become adequate to the discharge of their healthy functions when the caliber of the vein is diminished by compression. In one of the cases mentioned by Dr. Thomson, the commencement of the malady is referred to a crush: my patient referred his to a kick; it is possible, then, nay, it is probable, that the determination of the blood to the parts, consequent upon the injury inflicted, may have caused some dilatation of the canals of return, sufficient in amount to render the valves unequal to their duty; which circumstance would not only perpetuate the dilatation, but would allow the weight of the column of blood in these vessels to operate continually as a means of gradually increasing the evil.

As the treatment of varicocele by pressure brings us into direct contact with the instructions usually given for effecting a diagnosis between this morbid state and a hernial lesion, it may be necessary to refer to these directions, or rather to those circumscances which are really worthy of reliance. They are not numerous, as only four points seem deserving of careful attention and some degree of trust, individually, while collectively they may serve to establish our diagnosis. These are, first, the history of the case, not always obtainable from an intelligent source; second, the peculiar feel of the scrotum, compared, as it has been in varicocele, to a bag of earth-worms, as differing from the smoothly rounded swelling of a hernial protrusion; third, the sensation communicated by pinching up the parts at the ring, and rubbing them

between the finger and thumb; and, fourth, the mode of return of the swelling when completely reduced, whether from above, as in hernia, or from below, as in varicocele. It is now known that moderately firm pressure prevents the return of both. That any well-educated surgeon, after a careful examination, can mistake the one malady for the other, is hardly conceivable; but should they occur together in any case, the hernial protrusion being small, it is possible that the latter may be overlooked by the surgeon, the mass of enlarged veins attracting all his attention, and at once deciding his diagnosis. Should this, however, be accompanied by strangulation and the symptoms usual in such a case, the surgeon will then be led to look deeper for the cause of the more urgent symptoms. To those who are interested on this point I would recommend a perusal of Dr. Thomson's paper, already cited, more especially as the case detailed by him, and the remarks which follow it, bear particularly on the mode of diagnosing between these two morbid states.

As might have been predicted, some have been afraid to employ the truss, through a fear of rendering matters worse, but Mr. Curling has stated, that among all the cases of hernia which he has seen, in which a truss has been worn for a length of time, he has not met with one, and cannot recollect one complicated by varicocele. It may be that the one lesion acts as a prophylactic to the other, even where a truss has not been worn, by each so filling up the inguinal opening as to prevent the descent of the bowel in the one case, and the dilatation of the veins in the other. However this may be, it cannot be denied that the author of the above statement has enjoyed large opportunities of seeing and examining such cases.

The objections to this mode of treatment are few, if indeed there are any worthy of attention. Mr. Curling lays much stress on the pain and inconvenience caused by the instrument, and instances two cases in which the patient had been obliged to discontinue the wearing of the truss; and Professor Syme also stated that he thought the remedy worse than the disease.

In the cases treated by Dr. Thomson, we find that very little is said of the annoyance or suffering produced by the instrument; in none of them has it been severe, or even protracted, and it was exceedingly trifling in the case under my charge, and did not last longer than two or three days; so that I am disposed to regard this objection as deserving of little consideration, and referable, in all probability, to the imperfection or unfitness of the instruments employed in the cases which have been adduced.

Again, it has been said, that the pressure must be so firm as to be intolerable; but it may be safely affirmed, that a degree of pressure which becomes unbearable must be greater than is required for the object we have in view; and, laying the question of toleration of the instrument aside, it ought to be discontinued, because it may endanger the integrity of the testis, the preservation of which is one of the desiderata, and the chief merit of this mode of treatment. It is indeed very probable that a truss with a very powerful *circular spring* might operate as powerfully in producing rapid atrophy of the testis, as any

of the *obstructive* operative measures which have been already named, a result not unfrequently observed in hernial patients, where a very strong truss has been long worn over the external abdominal ring. The truss should be so constructed that the degree of pressure can be regulated by the surgeon or by the patient himself; and such is the nature of the instruments used in the preceding cases, and here recommended. It may also be laid down as a general rule, that a degree of pressure, firm enough to prove effective as a curative agent, will not be difficult to bear. Should we meet with exceptions to this, it has been recommended, that such patients should at first wear an instrument of less power, to be followed by a more powerful one, when it can be borne.

All modes of operative interference hitherto proposed have been utterly discountenanced by the highest living authorities in surgery, so that we are confined to this remedy or to none: either to abandon these cases as incurable, or try some such method of relief. The advantages of the treatment by pressure are numerous; such as, an avoidance of confinement to bed, house, or even absence from business, and consequent concealment, for few patients so affected will be desirous of making their malady known to any except their medical attendant; there is no danger to life; no wound is inflicted, hence no risk of inflammation of veins, of sloughing, of hemorrhage, or any other of the occasional dangers inseparable from cutting operations, among which erysipelas is not the least formidable. The wearing of the truss is also quite compatible with the continued use of all the usual palliative measures, with the addition of the cold plunge-bath, which ought not to be neglected.

The time during which it is necessary to wear the truss has been stated to range from nine to fifteen months, and some cases may require a longer period; but time is of little consequence, since the patient is not confined to the house, or in any way prevented from attending to business.

Doubtless, cases of disease do occur, so complicated that all remedies are found to fail, and there may also be cases of varicocele so complicated with other forms of disease, that the application of a truss may either be inadmissible or inadequate to effect a cure; and, while it is improper to draw inferences from such a limited number of cases as I have been able to collect, upon which to pin our faith dogmatically; still, I may be allowed to give it as my decided opinion, that the treatment by pressure is the only course we ought to adopt; that a trial of it should be recommended in every complicated case; that it is free from danger; not difficult to bear; and will be found sufficient for the cure of almost all cases of varicocele.—*Dublin Quarterly Journal of Med. Science, November,* 1851, *p.* 319.

114.—*On Spermatorrhœa.*—[In Mr. Acton's work no allusion is made to the use of cold hip-baths in this affection, though it forms the chief means employed by an advertising practitioner in the metropolis, who has the reputation of being more successful in this particular affection than any of his notorious brethren of the 'Manhood,' and 'Silent Friend' school. The Reviewer observes]

We have seen or heard of many cases in which these baths proved

of undoubted and very great advantage. The patient begins by sitting in a hip-bath, the sitz-bath of Priessnitz, for five minutes three times a day, the water being brought to the temperature of 65°. The time is gradually increased and the temperature lowered, until the patient sits for twenty minutes, three times a day, in water at 50°. In some cases, the spine is sponged for three or four minutes before leaving the bath, and very often a shower-bath is used after the first daily sitting-bath, the head being protected by a conical cap. Gentle exercise for five minutes before, and half an hour after, each of these processes is ordered. From what we have seen of the results of the treatment, we shall always be inclined to adopt it, before cauterising the urethra or following any other plan of treatment which may be hazardous. We have seen some cases of persons whose powers had been debilitated by long residence in hot climates, where the effect was very speedy and remarkable; and we have been informed, on credible authority, that the fecundating power of married men, whose generative energy was in other respects unimpaired, has been evidently restored by a few weeks' course of these baths.—*Brit. and For. Medico-Chirurg. Review, July*, 1851, *p.* 190.

115.—THE ANATOMY AND DISEASES OF THE PROSTATE GLAND.

By John Adams, Esq., Surgeon to the London Hospital.

[Mr. Adams illustrates a case of acute prostatitis as follows. A young man, of irritable constitution, contracts gonorrhœa. He employs strong injections at an improper stage of the disease, pursuing at the same time his former mode of life. The result is an increase in the inflammation, which now extends to the prostatic part of the urethra, and the neck of the bladder, inducing distressing symptoms, and, if not checked, involving the prostate gland itself.]

There is one point of considerable practical importance connected with chronic prostatitis to which Mr. Adams draws particular attention; it is the frequent implication of the prostate gland in cases of long-continued gleet, and he considers that, in many instances, the discharge is entirely due to an increased and altered secretion of the follicles of the gland. He shows, very properly, the inutility of employing injections in cases of gleet depending upon the cause now mentioned, and extols Chian turpentine as possessing quite a magic influence over it, which circumstance he attributes to its exercising a specific action upon the prostatic part of the urethra, and on the prostate gland itself. We have found Chian turpentine of marked benefit in urethral discharges of various kinds, as well in the sub-acute stages of gonorrhœa as in that form of gleet dependent upon irritation of the prostate gland; but we cannot say that it displays as much power over the latter disease as the author's remarks would lead us to suppose. The medicine is of uncertain efficacy in all cases for which it is employed, and will rarely, according to our experience, exhibit its curative effects "instantly" in any.

Mr. Adams next touches upon "prostatitis from onanism," a subject

as important as it is delicate, and which, from being culpably overlooked by those who study their profession scientifically, has come almost entirely within the domain of the ignorant empiric. To Lallemand the profession is certainly indebted for the light which his careful investigation of cases has thrown upon this important subject; but his views, upon the whole, are very partial, and he has left considerable room for further practical information. The author draws an important line of distinction between spermatorrhœa the result of chronic prostatitis, and that, the consequence of an irritable state of the prostatic part of the urethra induced by the disgusting practice of onanism; and it is of much moment to attend to this point of distinction, as the treatment of the two cases materially differs. No doubt prostatitis is, as Mr. Adams remarks, frequently attributable to onanism; but if we are to cure the spermatorrhœa we must remove the inflammation of the organ.

When frequent involuntary emissions are the result of an irritable condition of the prostatic part of the urethra, there is no plan we have found so effectual as the occasional introduction of a bougie. Very often the state of the urethra is more than that of irritation, for it amounts to chronic inflammation. In such cases if we employ a moderate-sized instrument we shall often experience some resistance just as the bougie arrives at the prostate gland, such as would be produced by a thick fold of the membrane; the patient, too, at this part of the operation, starts with pain, which in some instances is described as sickening, being followed by faintishness and a tendency to nausea. If there be no obstruction we should at once apply the nitrate of silver to the prostatic part of the urethra; if there be, the probability is that the use of the bougie will, *per se*, remove the irritable state of the canal, and thus cure the emissions. Under any circumstances the caustic can be employed with greater ease after the obstruction has been overcome. In addition, Mr. Adams recommends the administration of conium, and the use of cold water injections per rectum, and judiciously alludes to the great necessity that exists for observing moral treatment.

But of the various diseases of the prostate gland the most important for the study of the surgeon is the senile enlargement, or hypertrophy of the organ, because it is so common in occurrence, and because the consequences to which it leads so frequently demand his promptest assistance. Though it is an affection well known to be beyond curative treatment, still it can, by proper measures, be greatly retarded in its progress, and its symptoms, when urgent, be mitigated.

The author gives a systematic, but perhaps too brief and superficial account of the symptoms, morbid anatomy, etiology, and treatment of this affection, still, many of his observations exhibit a sound, practical knowledge of the subject. After marking the different alterations in the character of the urine, corresponding with the different stages of prostatic disease, he alludes to the pathological changes in the state of the bladder. For the varying capacity of that viscus in cases of enlarged prostate he attempts to offer what he conceives to be a plausible reason, viz., that when it is contracted in size there has been inflammation of the prostate extending to the bladder, whereas when it is enlarged, that this condition is not found to exist. It occurs to us that this supposition is not

at all necessary to account for the pathological condition to which we allude, for whether the bladder be diminished or increased in capacity must depend upon whether the prostate gland is so circumstanced as to act as a foreign body continually keeping up irritation, or to offer such effectual resistance to the escape of the urine that there must be a permanent state of distension of the organ. In some instances, where there is not the slighest indication of the presence of inflammation, the irritability of the bladder is so great that the individual cannot retain his urine for fifteen minutes consecutively without experiencing great pain and distress, while there are other cases in which the existence of inflammation is unquestionable, but where a distended bladder, coinciding with retention of urine, is the condition present.

Mr. Adams draws especial attention to what has been termed "the fluttering blow of the bladder," and urges the necessity of attending to the nature of this phenomenon, so as to avoid mistaking it for the evidence of stone in the bladder. We have at present a gentleman under our care for enlarged prostate, in whom the phenomenon is most remarkably distinct, and who might most readily be considered to be the subject of calculus in the bladder. Upon introducing a catheter, which passes with ease, and drawing off nearly all the urine, two sudden, abrupt taps are distinctly felt against the extremity of the instrument. then, upon withdrawing it for a short distance, just as the remainder of the urine is expelled, the same sensation is again communicated to the hand. We have no doubt that in this case a vesical pouch or pouches exist, which are the cause of the peculiarity mentioned.

There is no pathological change which has baffled more completely a rational conjecture as to its cause than hypertrophy of the prostate gland, because the nature of that change is contrary to analogy in all other respects. When the animal machine is fast declining, when in all other parts and organs nutrition no longer counterbalances decay, and in some complete atrophy exists, it is then the prostate gland exhibits a perfectly opposite tendency, and passes into a state of hypertrophy. Mr. Adams leans to the idea that the cause of this remarkable change may be found in the venous congestion which is generally met with around the prostate at the middle period of life, but we cannot think that this explanation is in the least satisfactory; and indeed we conceive that if venous congestion holds any necessary relation to enlarged prostate gland, it is rather the effect than the cause of the hypertrophy.

As regards the treatment of hypertrophy of the prostate gland, we believe the great secret in giving relief, and delaying the progress of the disease, consists in the regular and judicious employment of the catheter. The affection seldom lasts for any time without preventing the complete evacuation of the contents of the bladder; every time the patient makes water some fluid remains behind. This circumstance soon leads to inflammation of the mucous membrane of the bladder, and it is then that the urgent and distressing symptoms belonging to the disease occur. Now, when the urine is regularly and completely evacuated by artificial means, these latter symptoms will be found to be greatly postponed. In giving his preference to the horizontal posture for the introduction of catheters, Mr. Adams assigns the following reason. He says:

"Where the third lobe is much enlarged, and constitutes the cause of retention, when the patient is erect it falls forward, and, impinging upon the apex of the catheter, prevents the instrument from passing into the bladder; whereas, if the patient be laid on his back, the third lobe falls backwards, and the instrument glides freely onwards without impediment."

We do not exactly understand this explanation. If Mr. Adams means by the phrase "falling forwards and backwards" that the middle lobe is sometimes pendulous, his statement is perfectly correct; but we cannot understand how position can materially affect it, for, even allowing that the lobe falls forwards when the individual stands in the erect posture, its very pendulousness would prevent its offering any effectual resistance to a catheter such as is usually employed in prostatic cases. On the other hand, if he means that the direction of the prostatic part of the urethra is influenced by position, then we fully coincide in his view. Every surgeon must have observed, that in many cases besides those of enlarged prostate—in strictures situated in the prostatic part of the urethra and in obstructions at the neck of the bladder—attention must be paid to position, to succeed in introducing an instrument. The direction of the canal differs greatly in the horizontal and the erect posture, and as we cannot ascertain beforehand the exact alteration which the morbid lesion has produced upon the canal, so as to determine which position to observe, it is better, as Mr. Adams remarks, always to attempt the introduction of the instrument first in the horizontal posture, and if we fail in our attempt, then to resort to the expedient of placing the patient in the standing position.*

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DISEASES OF THE EYE AND EAR.

116.—HERNIA OF THE IRIS; RAPID RETRACTION BY THE USE OF ATROPINE ON BOTH EYES.

The 'Philadelphia Medical Examiner' mentions a case of wound of the cornea, under the care of Mr. Morehouse, where the iris was herniated. Attempts at reduction were made by touching the prolapsed iris with a solution of atropine, (five grains to the ounce of distilled water, but with little result. Mr. Morehouse then thought of taking advantage of the consentaneous action of the two irides, and applied the solution to both eyes. This method succeeded at once, the iris retreated, and the wound of the cornea soon healed up.—*Lancet, Aug.* 9, 1851, *p.* 131.

117.—*On a New Method of Treating certain Cases of Epiphora.*—By WILLIAM BOWMAN, Esq., F.R.S. [This treatment applies to those cases which depend on a displacement of the puncta lachrymalia out of

* From a Review of Mr. Adams's work on the Prostate Gland in the 'Dublin Quarterly Journal,' Nov. 1851, p. 465

the course of the tears, or on an obstruction of the canaliculi between the punctum and caruncle, the inner extremity of the canals, together with the lachrymal sac and nasal duct, remaining healthy.]

The author describes the exact nature of these cases, and relates examples. The treatment which he has devised consists in slitting up the canal from the punctum on the conjunctival aspect, so as to carry backwards the orifice at which the tears are received on to the mucous membrane near the caruncle; and he finds that the tears are, in fact, taken up by the remaining portion of the canal, while the end towards the punctum is converted into a groove. For the cases of obstruction from injury or other cause, he suggests a modification of this operation, by which the canal between the obstruction and the sac may be slit up for some way so as to receive the tears at a new opening.

The cases to which these new operations are applicable have been for the most part abandoned by surgeons as incurable.—*Med. Gazette. July* 11, 1851, *p.* 78.

118.—*The Eye Fountain.*—This is a new invention, by Mr. W. B. Pine, of the Strand, and will be found of great use by persons afflicted with weak or inflamed eyes; also after a long study. It is in shape like a small vase, attached to which is a small air-pump, the use of which is to propel, through a very fine jet, a continuous stream of water or lotion against the eyes. We have much pleasure in recommending this instrument to the notice of the Medical Profession, and others, as a great improvement on the old method of applying lotions. We would also remind our readers, that the German oculists have for many years used a long tube for the same purpose, and with good effect to the patient.—*Med. Times, July* 12, 1851, *p.* 55.

119.—*Deafness Successfully Treated by Vibratory or Musical Sounds.* By Dr. A. Turnbull—[Dr. Turnbull imagines that the greater number of cases of deafness arise from the torpidity of the auditory nerves from exposure of the tympanum to the cold of the atmosphere. Even when a healthy ceruminous secretion has been induced after wax has been removed from the ear, there often remains an imperfection of hearing, a sort of muffling accompanied by most distressing sounds.]

This (says Dr. Turnbull) led me to institute various trials to remove this morbid condition; and I am now enabled to state that the hearing may be perfectly restored by introducing into one ear an Æolian pitch-pipe, or other properly adapted musical instrument, and continuing the vibrations within the ear for the space of five or ten minutes daily. At the same time, and during this process, the opposite ear must be well closed. It will then be necessary to proceed in a similar manner with the other ear. This plan of treatment ought to be continued for a week or two after the patient's recovery, and ought to be left off with the lowest note. It may be well to state that no good effects can be derived

from this method unless the vibrations be confined chiefly within the ear, so as to localise their effects.

It is right also to presume that the vibratory mode of treatment will fail to be permanent in its effects, unless the healthy secretions be first restored. The cases in which success is greatest are those in which the ticking of a watch can be heard when pressed upon the temple bones, and those in which hearing is temporarily increased during the bustle and noise that prevail more or less in the open air, or in carriages, or railway travelling, as long as the vibration is kept up. This plan of treatment generally removes disagreeable noises in the ears and head in chronic and nervous deafness.—*Med. Gazette, June* 6, 1851, *p.* 1010.

DISEASES OF THE SKIN.

120.—ON THE TREATMENT OF ERYSIPELAS BY THE MURIATED TINCTURE OF IRON.

By G. Hamilton Bell, Esq., Edinburgh.

[Mr. Bell describes a mode of treating this disease which he has employed for upwards of a quarter of a century, without failing in one single instance. In no instance, by its employment, has suppuration taken place, and the patient, he states, to be generally left in a more robust state of health than he was previously.]

Mode of administering the remedy.—Of course the first object is to have the bowels freely acted on. If the erysipelas be mild, fifteen drops of the muriated tincture of iron are administered in water every two hours until the disease is completely removed. When the attack threatens to be more severe, the dose of the tincture is increased to twenty-five drops every two hours, and persevered in night and day, however high the fever and delirium. The only local applications I ever find necessary, are hair powder and cotton wadding. While I depend for the removal of the disease on the chalybeate, it is necessary that the bowels should be attended to throughout the treatment.

Cases.—I. 25th Dec., 1832.—Mrs. Naughton, a poor woman, about 60 years of age, of broken constitution, and having what is vulgarly called "shaking palsy"—a state of continuous chorea—had been suffering from erysipelas some days, and I was called to see her late at night. I found her head entirely covered with erysipelas; she was in a state of great exhaustion, and delirious. Ten drops of the muriated tincture of iron were ordered to be taken every two hours. On the 26th she was calm and appeared easier; cont. tinct. 27th.—Quite collected, inflammation and swelling decreasing; cont. tinct.; to have a dose of oil. 28th.—Inflammation rapidly disappearing; nourishing diet; continue drops. 30th.—Recovering fast; *perge.* 2nd January.—Erysipelas gone, and the poor woman wonderfully well.

II. 20th May, 1835.—I was called to the Waterloo Hotel, at one o'clock p.m., to see R. R., Esq., a stout gentleman, of full habit, about

30 years of age. I found him suffering from excruciating pain in the soles of the feet, which he ascribed to cold he had caught the previous day in coming from Glasgow. The pain was so acute that he could not bear the weight of the bed-clothes, nor his feet to be touched in the gentlest manner. Tongue loaded; pulse irregular, but not accelerated; skin of natural temperature, except on the feet. Eighteen leeches were applied, and he had six grains of calomel, followed in three hours by a dose of the compound powder of jalap.

Vespere.—Pain of feet relieved, but there is excessive prostration of strength. Tongue still loaded; thirst; pulse irregular and unsatisfactory. The medicines had acted freely, and brought away a quantity of dark coloured offensive scybalous matter. Slight erysipelatous blush on the right ankle. The following medicines to be given immediately:—calomel, five grains; henbane, six grains; opium, one grain; James's powder, three grains; in the form of pills.

21st.—Slept well; pain of feet much diminished; right ankle swelled and red; complains of pain behind the knee; much thirst; skin natural; pulse 120, irregular; the evacuations from the bowels black, watery, and offensive. A table-spoonful of a mixture containing one part of the spirit of Mindererus and two of camphor mixture, to be given every two hours. Hair powder and cotton wadding to be applied to the feet and ankles. 2 p.m. No improvement; spots of erysipelas at the roots of the toes and over the instep, extending to the ankles. In consultation with Dr. Abercrombie, the following medicine was ordered:—Half a drachm of the compound powder of jalap and ten grains of rhubarb. The camphor and sp. Mindereri to be continued. 5 p.m.—No improvement; pulse 130. 8 p.m.—Dr. Abercrombie again saw him. Erysipelas rising on the leg; vesicles on the instep; tongue much loaded; stools black and unwholesome; prostration continuous. I explained to Dr. Abercrombie my mode of treating erysipelas, and obtained his assent to the exhibition of the muriated tincture of iron,—twenty drops were ordered to be given every two hours. A colocynth pill to be taken at bed time. *Midnight.*—Bowels freely moved; two doses of the tincture of iron had been taken; pulse 100, fuller, and more regular; skin hot. The colocynth pills not to be taken until morning. Cont. tinct.

22d, 8 a.m.—A sleepless night; suffering much from rheumatism in right arm; less pain in the soles of the feet; erysipelas not extending; pulse 100, full and soft; bowels not open; to have the colocynth pills. *Noon.*—With Dr. Abercrombie. Tongue cleaner; skin soft; erysipelas diminishing; rheumatism very severe in right arm. To continue the iron, and to have forty drops of colchicum wine three times a-day. 7 p.m.—With Dr. Abercrombie. The symptoms more satisfactory; perspiring; *perge.* The improvement continued, and on the 25th the erysipelas had entirely disappeared. The rheumatism was more obstinate, but Mr. R. returned home in perfect health on the 6th June.

I have seldom seen more alarming exhaustion than appeared in this case for the first six-and-thirty hours after the attack.

III. 6th March, 1841. Mrs. W., æt. about 40, of full habit, complains of having a painful boil above the ear; there is also a patch of erysipelatous inflammation extending over the cheek; the ear much swollen.

To have fifteen drops of the muriated tincture of iron every three hours; hair powder to be applied to the inflamed surface.

7th.—Boil better, but erysipelas extending all over the side of the face. To continue the steel drops.

8th.—Erysipelas subsiding. To have an aperient; cont. tinct.

12th.—Patient well.

IV. 7th July, 1843.—Mr. A. W., æt. 16, a stout youth, of florid complexion, attacked with fever and headache. Ordered a dose of calomel and antimonial powder, to be followed by a black draught.

8th.—Erysipelas appeared over side of the face, with much fever; bowels free. To have ten drops of the muriated tincture of iron every two hours.

9th.—Less fever; erysipelas arrested; cont. med.

10th.—Disease stationary. The tincture to be increased to twenty drops every two hours.

12th.—Considerable improvement.

15th.—Erysipelas gone.

V. 10th December, 1845.—R. S. W., Esq., æt. 50, a delicate man, having had his constitutional strength injured by an accident in early life. I was called to the country to see him, and found him suffering a severe attack of erysipelas on the right side of the head; ear much swollen; pulse 100 and throbbing; great thirst; tongue furred; slight confusion of head; bowels open by medicine. Fifteen drops of the muriated tincture of iron to be taken every three hours.

11th.—Very ill; erysipelas extending; severe headache; troublesome dry cough. The chalybeate tincture to be continued; to have a cough mixture and effervescing draughts.

12th.—Less confusion of ideas in the morning, but erysipelas extending all over the face, which was much swollen.

Vespere.—Very restless. To have half a drachm of the solution of morphia in an ounce of camphor mixture at bed-time; the tincture continued.

13th.—Erysipelas extending, covering nearly the whole head and face. Had not taken the drops regularly; bowels free; the drops resumed.

14th.—No improvement; the head an inflamed mass, and much swollen; takes nothing but water; cough troublesome; mind wandering. To continue the tincture, and to have an aperient.

Vespere.—A diminution of the inflammation, and swelling of the side of the head first affected.

16th.—No amendment; left side of the head tremendously swollen; very incoherent all day. I remained with my patient during the night, and induced him to take the drops regularly.

17th.—A most satisfactory change; quite coherent; pain and swelling of face diminished, although quite a mask of dried exudation. To have an aperient, and continue the tincture.

18th.—Watched and administered the drops during the night, and to-day there is a wonderful improvement in all his symptoms. To continue the medicine.

21st.—Doing well.

1st January.—Has had no interruption to his convalescence, and feels in better health than before his illness.

There was probably from the state of the patient's mind, much irregularity in the administering the steel drops until I personally watched the case; and, on the 16th, the disease had assumed a very alarming appearance; but immediately upon the medicine being regularly given, so as to bring the system thoroughly under its influence, a most satisfactory change was produced in the symptoms; the fever, and delirium, and pain subsided, calm sleep was induced, and the inflammation gradually disappeared.

VI. 16th January, 1850.—Miss C. M. seized with pain, inflammation, and swelling, extending over both cheeks and nose. Pulse 100; tongue loaded. A dose of calomel and James's powder ordered to be given at bed-time, to be followed in the morning by hourly doses of the solution of Epsom salts and tart. emetic, until the bowels should be freely moved.

17th.—Face more swelled and inflamed; pulse 80; tongue cleaner. To have fifteen drops of the muriated tincture of iron every three hours; hair powder to be applied to the inflamed surface.

18th.—Face less painful. To continue the drops regularly, and to have an aperient.

19th.—Face entirely encrusted with exudation, having very much the appearance of the advanced stage of confluent small-pox; erysipelas not extending; no fever; tongue clean, but much annoyance from cough. To have a cough mixture, and continue the drops. 20th.—Improving. 21st.—Doing well.

22d. So much better as to be in the drawing room. The disease happily left no sort of mark on a face of much beauty.

VII. 1st November 1850.—W. C., Esq., æt. 73, had been suffering from a severe catarrh and cough for some days. Felt yesterday as if his shoe were too tight for the left foot, and on going to bed the ball of great toe became agonisingly painful; no sleep nor ease in any posture. Ball of toe is much swelled and tender to the touch, having all the character of gout, but the inflammation is erysipelatous, extending over the front of the foot. Pulse 60, irregular; bowels open from medicine; tongue clean. Fifteen drops of the muriated tincture of iron to be taken every three hours.

Vespere.—Mr. C. declares that the drops acted like a charm, and at once relieved him from the pain. Redness and swelling continue. To have an aperient, and continue the drops.

2nd.—Scarcely any pain, although the inflammation is extending. A troublesome cough. The dose of the tincture to be increased to twenty-five drops. To have paregoric for the cough.

3rd.—Inflammation spreading towards instep. To have an aperient pill, and morphia lozenges for the cough. Continue the drops.

4th.—Inflammation fading.

5th.—Improving.

8th.—Able to go out of doors.

I have in my journal several cases in which erysipelas was combined with gout. Two of these occurred in gouty subjects, and in both the

health was restored by the chalybeate, as in the above case of Mr. C. This gentleman had, two years ago, an attack of erysipelas in his thigh, and was cured by the steel drops. He never had gout before, but I understand his father had suffered from it.

With regard to the diet of the patient under erysipelas, unless when there is much fever, I always recommend it to be generous, and of easy digestion. In a case at present convalescent, in which the attack was very similar to Mr. C.'s, only that while the great toe and foot were violently inflamed, the knee of the other leg was also affected, from the habits of the patient—a constitution broken from intemperance—I was obliged to allow, along with the drops, nearly a bottle of port a-day. In this case the podagral erysipelas has disappeared, and my patient is in better health than he has had for several months.

[Dr. Charles Bell, brother of Mr. G. H. Bell, adds a few remarks with cases. He says:]

The beneficial effects of this medicine are so immediate and invariable in the common forms of erysipelas, that I feel convinced were it given with boldness and perseverance in puerperal fever, which is now generally admitted to be analogous in its nature, and frequently accompanied by erysipelatous inflammation on the surface of the body, many valuable lives might be preserved.

In pursuing the chalybeate treatment of erysipelas, I consider it of much importance to bring the system rapidly under its influence, in order to effect a speedy removal of the disease. I have therefore been in the habit recently of giving much larger doses of the tincture than I ventured to prescribe at first. It is a remarkable circumstance in the exhibition of this valuable remedy in the erysipelatous diathesis, that although given in much larger and more frequently-repeated doses than have been recommended in our dispensatories, it never produces headach, and when this symptom is present it quickly relieves it; at the same time, it reduces and regulates the pulse: thus showing that in this state of the system, it has a soothing and sedative, as well as alterative effect.

The cases above related prove so clearly the remarkable influence which this medicine has in overcoming the idiopathic form of erysipelas in the adult, that I consider it almost unnecessary to increase the length of this paper by producing additional evidence on the subject, although I have had many cases illustrating the fact in my own practice. I am more anxious to direct attention to the advantages to be derived from this mode of treatment in *infantile erysipelas*, in which the field for curative measures is so very limited; and also to its effects in that form of the disease consequent on external injury, in which the best treatment has hitherto been too often unavailing, especially in our hospitals, and after operations. With this view, I shall now briefly relate a few cases illustrative of the treatment in each of these forms of erysipelas.

On the 27th March, 1849, I was requested to see Mrs. Munro's baby, of a few weeks old, which was suffering from a severe attack of erysipelas, extending from the wrist to the elbow. I ordered it to have a dose of castor oil immediately, and two drops of the tincture of the muriate of iron, to be given every two hours in a teaspoonful of water, with a little sugar. In three days, the erysipelas had entirely disappeared, and the infant seemed lively and in good health.

Mrs. M.'s baby, an extremely emaciated infant, born on the 24th Jan., 1850, was seized a few days after birth with erysipelas, which occupied the vulva and nates, and was accompanied by severe catarrh and cough. There were much fulness and tension of the lower part of the abdomen, the urine was retained, and the bladder could be felt like a small orange immediately above the pubis. Being naturally weak, it soon became so excessively feeble that no hopes were entertained of its life being preserved, and it was deemed advisable to have it christened without delay.

Small doses of calomel and James' powder were given at short intervals, along with a cough mixture composed of ipecacuan wine, carbonate of soda, water, and syrup. Very little benefit seemed to arise from this treatment; I therefore stopped the calomel and antimony, and ordered two drops of the tincture of the muriate of iron to be given every two hours in a little sugar and water. The infant had become so exhausted, that I was obliged for some time to order, in addition to the tincture, a drop of brandy to be given every half hour.

Under this treatment, the erysipelas and dysuria rapidly disappeared, and the infant slowly gained strength, and is now a lively and healthy child.

Mrs. C.'s baby, a fine healthy looking infant, was born on the 27th September, 1850, with six fingers on each hand. A few days after birth, erysipelas appeared on the vulva and nates, accompanied with a disordered state of the bowels and frequent green evacuations. Having endeavoured for some time to correct this state of the bowels with small doses of grey powder, rhubarb, and the carbonate of soda, and occasional doses of castor oil, without effect, I ordered two drops of the tincture of the muriate of iron to be given every two hours in a little water and sugar. For some time little progress, however, was made in removing the erysipelas. One day it seemed to subside, and on the subsequent day it was as bad as ever. I was induced to believe that the medicine was not given regularly, and that some days it was not given at all. There was reason also to suspect that the nurse's milk was bad, and I was informed that her own child had been affected in the same manner. I recommended that another nurse should be got, and insisted on the muriated tincture being given regularly. The result was that the erysipelas was removed, and the child's health so much improved, that Mr. Syme was enabled, within ten weeks after its birth, to remove the supernumerary fingers with success.

I shall now give a few cases of *sympathetic erysipelas*, or that consequent on external injury. Mrs. D., of broken constitution, received an injury on her nose, which slightly abraded the skin. Erysipelas of the upper part of the face soon followed. She was put on the tincture of the muriate of iron, and in three days the disease was entirely removed.

3rd September, 1850.—I was requested to see Mr. Thomas Ewart, railway guard, who was said to have met with a serious accident. I found him suffering under phlegmonous erysipelas, extending from the ankle to the knee,—the consequence of a slight bruise he received on his shin about a fortnight previously, and which he had neglected. The usual treatment was adopted, viz., evaporating lotions, poultices, and incisions, along with internal medicines, such as calomel and antimony,

with saline draughts; but with no improvement in the leg,—there being much swelling and inflammation, and the wounds had a dry and unhealthy look. For some days I had great fears that the patient would sink under the disease; and my apprehensions of his ultimate recovery were much increased when erysipelatous inflammation appeared above the knee and extended to the hip, occupying the whole of the posterior part of the thigh. There was a considerable degree of fever, pulse 110, flushed face, headache, and severe cough.

Twenty-five drops of the tincture of the muriate of iron were ordered to be given in water every two hours, along with a diaphoretic mixture, containing the solution of the acetate of ammonia and antimonial wine. The bowels were kept open by saline medicines.

The headache and fever soon subsided, and the erysipelas disappeared from the thigh The leg healed slowly, in consequence of the extensive sloughs which formed round the incisions, and the luxuriant granulations which afterwards formed requiring the frequent application of escharotics. The man ultimately made a good recovery, and returned to his duty in better health than he had enjoyed for a length of time before his accident. I have no doubt, had the chalybeate tincture been given at an earlier period in this case, the disease would have been checked in its commencement, and no sloughing would have taken place. I am the more convinced of this from the result of the following case.

On the 4th December, 1850, I was called a few miles into the country to see Mr. T.'s son, aged about four years. He had always been paralytic in his right leg, in consequence of an accident it was supposed he had met with when an infant. For some time previous to my seeing him, he had suffered from a painful swelling on the right side of the anus, which suppurated, and was opened by the family surgeon, and a large quantity of pus discharged; but the abscess showed no tendency to heal. While playing on the carpet, he slightly bruised the skin of his left leg under the knee, which was immediately followed by erysipelas extending from the knee to the ankle, and accompanied by high fever and rapid pulse.

Small doses of calomel and antimonial powder were ordered to be given every three hours during the day, and a dose of the essence of senna in the morning. In addition to these medicines, to have three drops of the tincture of the muriate of iron every two hours in thin syrup. The leg was dressed with flour and cotton wadding.

5th.—The erysipelas more generally diffused over the leg. To stop the calomel and antimony, but continue the chalybeate tincture, and keep the bowels open with the senna.

8th.—The erysipelas quite gone, and the original wound under the knee healed. No fever; tongue clean; and the little patient more cheerful than he had been for a length of time.

In conclusion, I shall shortly refer to two cases of *idiopathic erysipelas*, in which I was consulted some years ago. The one case occurred in a gentleman nearly eighty years of age, who had long been subject to periodical attacks of erysipelas in his legs. I recommended him to take the tincture of the muriate of iron; which removed the attack he was then suffering from, and he remained longer free from the disease than he

had done for a number of years. He lived until he was eighty-six years of age.

The second case was that of a gentleman of high talents and acquirements, rector of an academy in the south of Scotland. He had an alarming attack of erysipelas, and was attended by two intelligent medical men, who had adopted all the usual remedies with very little advantage. They, therefore, considered his case hopeless. The erysipelas was extensively diffused over his head and shoulders; there was much incoherence and great debility. Immediately on his system being brought under the influence of the tincture of the muriate of iron, the disease subsided, and he was gradually restored to health.—*Monthly Journal of Med. Science, June,* 1851, *p.* 497.

121.—*Empyreumatic Coal Oil used in Eczema.* By M. Lafont-Gouzi.—In the 'Transactions of the Medical Society of Toulouse,' M. Lafont-Gouzi highly extols the virtues of the oil obtained by the distillation of pit-coal in the manufacture of gas, as a remedy in certain eczematous affections, and in itch. He has used the oil in the treatment of eczema impetiginodes, of itch, of prurigo, of psoriasis, of purulent ophthalmia, of keratitis, and of otorrhœa dependent on cutaneous eruption *(otorrhées de nature dartreuse).* M. Lafont mixes eight parts of empyreumatic oil with thirty parts of axunge, and spreads the ointment over the parts affected with eczema; he asserts that it is the most active of siccatives. In cases of prurigo and of psoriasis, he replaces the axunge with an oil of henbane containing opium (*huile de jusquiaume opiaciée*). If the disease proves obstinate, he uses the undiluted empyreumatic oil. The following case is given in illustration of the efficacy of the treatment.

A woman of forty-five years of age fell under his care, on account of an extensive suppurating eczema of the whole forearm. She had used, for a year, various internal and external remedies, without obtaining the slightest benefit. The mineral waters of Luchon had been tried in vain. The surfaces were very red and encrusted; the intolerable sensation of heat was only appeased by cataplasms of the fecula of rice, &c. Three applications of the empyreumatic oil to the whole diseased surface, made at intervals of five days, restored the skin to its normal condition.

Finally, M. Lafont states that, for the last three years, he has used the empyreumatised ointment with complete success in treating itch, a disease in which so many other remedies have been justly recommended as efficacious.—*Journal de Méd.—Monthly Journal of Med. Science, October,* 1851, *p.* 381.

122.—*On Sycosis.*—By Erasmus Wilson, Esq., F.R.S.—[The author considers this as being essentially]

A disease of the sebiparous glands, whose secretion is poured into the hair-canals; but depending upon a disorder of assimilation, of which the local affection is but a manifestation. In regard to the treatment of this

most troublesome complaint, Mr. Wilson mentions that he has found the strong citrine ointment, the iodide of sulphur ointment, and the tar ointment, to be the most useful local applications; but that it is difficult to predict in any individual case, which of these will be most serviceable, one frequently succeeding where another has failed, or even proved highly injurious. At the same time he gives Fowler's or Donovan's solution internally; but he mentions a case in which a gentleman was nearly poisoned by two drops of the former.—*Brit. and For. Medico-Chirurg. Review, July*, 1851, *p.* 245.

123.—*Borax in Efflorescence of the Face.*—M. Vanoye, in these cases of red spots, or efflorescence of the face, so often seen in the young otherwise in good health, states he has found washing them several times a day with Hufeland's formula a most excellent remedy. It consists of borax two parts, orange-flower and rose-waters of each fifteen parts.—*Bull. de Therap.—Med. Times, Aug.* 9, 1851, *p.* 160.

124.—*Treatment of Scabies.*—M. Bazin, physician to the Hôpital St. Louis, of Paris, published in July, 1850, several cases of itch cured in a few days by frictions with the sulphur ointment all over the body. The same physician confirms, in 'L'Union Medicale' of Nov. 9, 1850, the efficacy of the treatment, by stating,—"The patients who formerly left the hospital after twelve or fifteen days only, and very often came back with a relapse of the disease, are now cured in two or three days." But this is not all, for M. Bazin, finding out that some patients have an insurmountable dislike to sulphur, was induced to try several ointments prepared with essential oils—as those of lavender, thyme, rosemary, &c., and likewise turpentine and mercurial ointment. None of these were effectual. He then had the idea of trying unmedicated axunge and oil, and found it answer remarkably well, six frictions during three days being sufficient.

It will be recollected that Mr. Taylor, surgeon to the Clerkenwell Infirmary, published a book some months since, (see 'The Lancet,' Oct. 12, 1850, p. 418,) wherein he advocates frictions of a like character for the cure of typhus fever, scarlatina, &c. It would be highly useful if frictions, with simple unctuous substances, were more extensively tried in the diseases spoken of by Mr. Taylor and M. Bazin. The ease with which the remedy is obtained, and the little risk which is incurred by its use, would render it inestimable if found efficacious, especially as regards the treatment of the poor. M. Bazin has likewise tried a chamomile ointment which cures the itch in three frictions. It is composed as follows:—Powder of fresh chamomile, white oil, axunge, of each sixteen ounces. M. Bazin proposes, therefore, in ordinary cases, that the sulphur ointment be used, (sublimed sulphur, very fine powder, of each two drachms; one yolk of egg; olive oil, one ounce, and two drachms and a half,) in exceptional cases, either three frictions with the chamomile ointment, or six with the simple oil and axunge.—*Lancet, September* 13, 1851, *p.* 253.

125.—*Carbonate of Ammonia in Chronic Psoriasis.*—M. Cazenave has for many years past employed carbonate of ammonia in squamous diseases of the skin. He prescribes 10 parts of ammonia to 240 of simple syrup, the patient taking from six to twenty-four grains of the salt daily.—*Med. Times, August* 9, 1851, *p.* 161.

126.—*Efficacy of Galium Aparine in Lepra.*—By Dr. J. M. Winn, Physician to the Cornwall Infirmary.—[In a letter to the Editor of the 'Medical Gazette,' Dr. Winn says.]

A gentleman, an acquaintance of mine, who had suffered for many years from lepra vulgaris, for which he had taken all the usual remedies without obtaining the slightest relief, informed me not long since that he had at length found a remedy for his disease. He told me that it was a wild plant, of which he did not know the name, but that he would show me the spot where it grew. On examining the plant, I discovered it to be the galium aparine, which grows so abundantly on the hedges in this country, and is commonly known by the name of cleavers or goose-grass. At the time I saw him he was taking a strong decoction of the plant, and under its use the rash was disappearing rapidly.

On making inquiries, I find that three other parties have been cured of similar diseases by the same remedy. One of the parties had been discharged from St. George's and also from the Middlesex Hospitals about twenty years since, as an incurable patient. The remedy was introduced here about twenty years since by some German itinerant quack.

I have as yet not had much experience in the use of this remedy. It appears to act as a mild diuretic, and may be given in large quantities, as it does not produce any injurious effect on the system. I use a decoction made by boiling a large handful of the plant in a quart of water for about twenty minutes. Of this decoction I give three parts daily.—*Med. Gazette, October* 3, 1851, *p.* 606.

127.—*Treatment of Lupus by the Topical Application of the Bi-ioduret of Mercury.*—M. Cazenave ('Annales des Maladies de la Peau.') after trying a variety of local applications in lupus, has come to the conclusion that none is more efficacious than the bi-ioduret of mercury. After a certain number of applications of this drug, with the transient local inflammations which it excites, he has seen the hypertrophied tissues, as it were, dissolved, the tubercles disappear, and soft cicatrices form. He has, in fact, seen the most repulsive cases heal, with no more disfigurement than arises from a patchy discolouration of the integuments.

The application is not in general painful at first, but it is soon followed by severe suffering, which lasts from six to twelve hours. The pain is accompanied by erysipelatous redness of the parts adjacent; but

the redness and swelling subside in three or four days. The iodide of mercury then forms a crust with the exudation which it occasions, and on falling off displays a smooth cicatrix. The same effects follow the application to lupoid ulcerations.

The bi-ioduret of mercury may be dissolved in ether, incorporated in an ointment, or suspended in oil. M. Cazenave prefers the latter. As the application is painful, and requires to be repeated five or six days, he recommends that only a small space should be touched at once.—*Provincial Med. and Surg. Journal, June* 11, 1851, *p.* 330.

VENEREAL DISEASES.

128.—ON THE TREATMENT OF VENEREAL DISEASES.

(From a Review of the Works of Messrs. Acton, Johnson, and Hunt, on Diseases of the Urinary Organs, in the 'British and Foreign Medico-Chirurgical Review.')

[The Reviewer, on the subject of treatment, remarks:]

Without bringing forward our own daily experience, we could easily prove from the writings of others, and from authenticated results of practice which has been essentially "expectant," that gonorrhœa, even of a severe kind, often terminates spontaneously—that when a patient avoids wine, spirits, coffee, and beer, takes little active exercise, drinks freely of water or any simple diluent, and observes scrupulous cleanliness, the disease commonly attains its maximum in a week, continues in this state one to two weeks, then gradually declines, and terminates about five or six weeks after its commencement. If to this natural treatment a little tartarised antimony be given when inflammatory symptoms run high, and a dose of castor-oil occasionally, the termination is hastened, especially if some simple astringent injection be used. That recommended by Mr. Johnson is a very good one. It is stronger than the solution of diacetate of lead generally used, containing two drachms of the *liquor plumbi* to six ounces of distilled water. We seldom find more than two requisite. One is a solution of alum, four grains to the ounce; the other an infusion of green tea, a drachm to half a pint. By ringing the changes upon them, we believe that all the good which an injection can afford may be obtained.

When the stomach will bear it, copaiba may be given in drachm doses for two or three days, and continued if it appear to be beneficial; but beyond this we do not believe it either necessary or advisable to proceed, in one of fifty such cases as ordinarily present themselves.

[Mr. Acton describes his method of active treatment, as follows:]

"When a patient applies to me in the early stages of gonorrhœa, before scalding in making water has come on, or when the acute symptoms have passed, I at once employ a strong solution of nitrate of silver; but,

as this efficient mode of treatment may become a very dangerous agent, I always inject the solution myself. The manner I proceed is as follows:—Having a solution of the crystallised nitrate of silver at hand, in the proportion of ten grains to one ounce, I desire my patient to make water, and placing him in an erect position against the wall, I inject a glass syringe full (about two drachms) of the solution into the urethra, and by pressure retain the fluid in contact with the mucous membrane a few seconds. It is as well, in doing this, to suddenly distract the patient's attention by some remark, otherwise the passage of the fluid along the whole length of the canal may be impeded by spasm or contraction of that organ. I then desire the patient to sit down for ten minutes or a quarter of an hour in an arm-chair, and to withstand the desire of making water, which, for the first few minutes, sometimes is very violent.

"The effect of the injection on different individuals is very striking. Some scarcely feel any pain; others suffer for a few moments most acutely, but usually the agony goes off in three or four minutes, and is replaced by mere temporary soreness, so that the patient is able to walk about. I, however, recommend him to lie down on the sofa for an hour or so, and keep quiet.

"The quantity of discharge, like the amount of pain, differs greatly in different individuals. Sometimes no further *discharge at all* is seen, and the patient gets perfectly well. More commonly the injection is immediately followed by a large quantity of serous or shreddy exudation, which soaks through the lint. This exudation is followed by a stringy yellow discharge. In a few hours this gradually becomes again serous, until it completely ceases, and redness of the meatus alone remains, which disappears in a few days.

"Of course, considerable pain would be felt did the patient make water immediately after the injection; but as the bladder has been previously emptied, micturition is not required, and the patient has only to combat for the first few minutes the desire to attempt it; and many hours will elapse before urine will be required to be passed, and by that time the effects of other treatment have been brought to bear, so that scalding is seldom or ever complained of by the patient.

"I have now no fear of leaving my patient, having applied a suspensory bandage, or what answers equally well, a handkerchief passed round the loins, and another tied in front and behind to support the testes, with strict injunctions to abstain from any kind of fluid whatever, so that the urethra should enjoy a few hours' repose. On the next morning the discharge has either altogether ceased, or a drop is only to be seen, and in the course of the day a mere weeping from the urethra occurs. The patient may now take fluids in moderation, consisting either of tea or soda-water, but coffee should be strictly prohibited, as well as wine, beer, and spirits. In some cases, towards the afternoon, the discharge returns again. If this becomes green or yellowish, I have no scruple in repeating the injection, with similar precautions; but I seldom have recourse to a third, and my patient is quit of a troublesome complaint in a very few days.

"The effect of nitrate of silver in a strong solution is very surprising, as may be judged of from the previous description. It appears to possess

a specific action in changing the vitality of the mucous membrane, substituting for the original inflammation a new one, whose principal characteristic is its short duration; it destroys, likewise, the morbid element.

"Out of the large number of cases that have been treated on this plan, I have never yet seen any ill consequences arise, not even hemorrhage or retention of urine. I may mention, however, that I have never employed the remedy except in private practice, where I have had the assurance that my patient would implicitly follow my directions. I should not recommend the treatment among out-patients at public institutions, nor, in fact, have any expectation that any abortive plan will generally succeed with them, but, on the contrary, be attended with such consequences as would soon prevent a surgeon from employing the treatment in private.

"I must however confess that this treatment has not, in my hands, been successful in the treatment of the first attack of clap in young men. In private practice a consulting surgeon does not attend, generally speaking, very young men with their first attack. Shyness, or not knowing where to apply for advice, perhaps, is the cause; but of the fact there can be no doubt, that I am comparatively rarely consulted for first attacks. When consulted the complaint has perhaps commenced several days, and the treatment is therefore no longer efficacious. From these circumstances, I am perhaps hazarding a wrong opinion; but, speaking from my personal experience, I would not advise caustic injections to be applied in cases of first attacks. No dangerous symptoms arise with common care; but I have not met with those certain results which have attended my treatment in persons previously affected.

"So great has been my success, that, with the precautions fully detailed above, I should strongly recommend the treatment in private practice, where, if it was not successful, a surgeon would be soon obliged to lay it aside, or be compelled to relinquish it, if it was found to be followed by ill consequences: otherwise, instead of giving it up, the surgeon would be given up by his patients.

"My own experience does not enable me to say if direct treatment, by means of injections alone, would succeed. I am always in the habit of combining it with general remedies, the modus operandi of which I am about to describe."

Now, (says the Editor of the 'Medico-Chirurgical Review,') we have given a pretty fair trial to this treatment, and have done what Mr. Acton has not, namely, endeavoured to ascertain its value alone, not vitiating the experiments by employing other means at the same time. The result has been, that it failed about as often as it succeeded; and when it failed, it made matters worse than before. We found it also quite impossible to determine beforehand if it would succeed or fail; and as an abortive treatment found it not more successful than a plan of steeping the penis in hot water, three or four times a day, for a few minutes at a time, until some faintness is produced. In slight cases we have often known this simple measure cure the disease in one day. Mr. Johnson decidedly objects to the nitrate of silver in the early stage of gonorrhœa. He says: "I have seen several cases of gonorrhœa, of a most obstinate and serious description, after its adoption. I have also

seen inflammation of the bladder, enlarged lacunæ, stricture in the anterior part of the urethra, and acute synovial rheumatism follow it." He relates one case which terminated fatally, after purulent discharges from the bladder for some months; and another in which synovial inflammation of the knee-joint was severe and obstinate, the ill effects in both cases apparently depending on the nitrate of silver. M. Ricord acknowledges that his plan "sometimes produces severe accidents, inflammation or gastro-intestinal irritation, and eruptions on the skin:"—we presume when he gives copaiba at the same time. Mr. Johnson says, that he has seen nearly fatal gastro-enteritis caused by large doses of copaiba, also inflammation of the kidneys; and he has been consulted in numerous cases of aggravated dyspepsia, in which the patients entirely attributed their complaints to overdosing with copaiba.—*Brit. and For. Medico-Chirurg. Review, July*, 1851, *p.* 186.

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129.—*Prophylaxis of Syphilis.*—Dr. Langlebert announced to the Academy that he had discovered a substance capable of destroying the effects of the syphilitic virus. This preservative consists of a strong alcoholic solution of soap, having an excess of alkali. Dr. Langlebert had performed several experiments by inoculating with the poison of chancres, and then applying his antidote within about five minutes afterwards. The effects of the virus had in every case disappeared.—*Med. Gazette, August* 8, 1851, *p.* 259.

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130.—*Syphilization.*—Here is a new term, and well may a new term be used, for the fact to be conveyed is quite new; but whether what is called syphilization is a good and allowable thing, is very questionable. Our readers are aware that Dr. Auzias Turenne, of Paris, succeeded some time ago in grafting syphilis upon animals, a result which had in vain before been sought. Monkeys were the poor creatures experimented upon; and it would appear that they actually and truly were made to contract syphilis by means of inoculation.

This success seems to have given Dr. Turenne a taste for inoculating; he went on experimenting, and at last found out that the syphilitic virus, like that of variola, may, by being inoculated upon a perfectly healthy person, preserve that person from any further attack of syphilis, although the patient may get in the way of taking the disease; this taking place in the same way as inoculation of the pus of small-pox sometimes preserves from any further onset of the disease. Cases are of course brought forward to strengthen this position.

But Dr. Sperino, surgeon to the venereal hospital of Turin, has gone still further. He has first fully confirmed Dr. Turenne's conclusions, in acting upon *fifty-two* of his patients; these were mostly affected with primary or secondary symptoms. The inoculations used to be made on the abdomen, and the spot covered with adhesive plaster, so that none of the virulent matter should be lost. Chancres were almost always

produced, and they were allowed to heal without cauterization, the pus having been taken either from the patient herself, or from another, where the chancre happened to be in the progressive stage.

Further inoculations, after the first had succeeded, yielded no result; and though Dr. Sperino went on placing virulent matter in the canal of the urethra, close to the anus, or on the vulva of women previously saturated with virus, he found that it would no longer take. The patients by being artificially syphilized, had in fact become proof against syphilis.

But not content with establishing this law (?) Dr. Sperino has formulated another; viz., that virulent inoculations are not only *prophylactic* but *curative!* All or nearly all the women who were inoculated, got rid either of the recent ulcers with which they were affected, or of chronic ones which had resisted mercury, iodine, &c. Thus it would now appear that infection need not any longer give people uneasiness: let them have the courage to get inoculated, and they are mailed against the syphilitic poison. Or if they should have any recent or chronic chancres upon them, let them again have recourse to inoculation, and they will not only be henceforth invulnerable, but they will also see their present symptoms disappear promptly. This discovery will certainly have a depressing effect on the sarsaparilla trade.—*Lancet, October* 11, 1851, *p.* 346.

131.—ON SYPHILIS.

By W. Acton, Esq.

"Syphilis is a virulent and specific affection, the essential character of which is its dependence upon a *special* cause, or a distinct morbid poison or *virus*, identical, and hitherto thought peculiar to man.

"Never arising *suâ sponte*, but always, in the present day, the result of contagion from another person, capable of producing, when coming in contact with the economy, local effects, in which we find the fatal cause which has produced them. These local consequences may react on the system, and develope constitutional symptoms which, under certain circumstances, are readily transmissible from the parent to the child, but which cannot again reproduce the specific cause which gave rise to them. Now, although this specific cause may reproduce its effects several times on the same individual (when placed under the necessary favourable circumstances), the general constitutional symptoms will occur but once in a man's life. Lastly, syphilis may be called a disease which most frequently requires a special treatment."

Chancre.—The true characters are best observed in the artificial ulcer produced by inoculation:

"During twenty-four hours succeeding the operation, the inoculated point becomes red; in the course of the second and third days, the surrounding parts are slightly swollen, and assume a papular appearance, or already traces of a vesicle are seen on the summit; on the third or fourth day a fluid, which is more or less transparent, is observed beneath the epidermis, and a distinct vesicle becomes apparent, where the papula previously existed, and a dark dot is seen in the centre, owing to the

coagulation of the blood which had escaped through the puncture of the lancet; from the fourth to the fifth day, the vesicle assumes a pustular character, and a distinct depression is seen in the centre, so that it represents very distinctly, at this period, the small-pox pustule. The red areola, which has been hitherto gradually augmenting in intensity, now as gradually fades away, and the cellular tissue, which was slightly œdematous, becomes infiltrated with plastic lymph. On the 6th or 7th day, the pustule is observed to be wrinkled, in consequence of the contents becoming thicker, and ultimately a crust takes the place of the pustule. If not interfered with, this crust assumes a conical appearance, increasing always at its base; it may ultimately fall off, or, if removed, leaves an ulcer seated on a slightly œdematous base, in depth equal to the thickness of the skin: the bottom of the ulcer is covered with a whitish pulpy substance or false membrane, which adheres so firmly, that it can with difficulty be wiped off. The ulcer is generally circular, and appears as if made with a *punch*.

"The margin, if viewed by means of a microscope, will be found dentated, and covered with a secretion similar to that seen at the bottom of the ulcer. The border is slightly œdematous and raised, and the areola around it is of a browner tint than at the previous stages; this œdematous condition of the border occasions a slight eversion of the edges, and hence the ulcer may assume a somewhat infundibuliform appearance."

This secretion removed from the surface of the chancre, and kept in close bottles during seven days, will produce all its effects at the end of that period, proving that the vitality of the part is not necessary for the preservation of the peculiar effects of the virus. To show the very minute quantity of virus necessary for producing specific effects, one drop has been diluted with a pint of water, and the inoculated fluid has produced a pustule. If alkalies or acids be mixed with the virus, and inoculation afterwards attempted, no effects will follow. These same substances will likewise destroy the property with which inoculation has invested the sore, of producing an analogous secretion, provided they be employed at an early stage. Simple substances, or ointments, will have no influence either in destroying or aiding the effects of the secretion.

[Mr. Acton believes that nothing but inoculation can positively declare a sore to be syphilitic. Mr. Acton is a strenuous advocate for the use of caustic.]

"Experiments on inoculation have incontestably proved, that if caustic be employed soon after the receipt of the virus, all further effects may be stayed; they have, moreover, shewn, that up to the third day the disease is of a local nature, entirely confined to the parts with which the virus has come in contact; and the patient may be guaranteed against the occurrence of secondary symptoms. I would remark here, however, how different are the laws of animal poisons. Glanders, when inoculated, and the pustule destroyed in twelve hours, produces its effects as usual; the rattle-snake poison acts still more rapidly, each animal poison having laws of its own. We may be called in too late; but the surgeon must not be inactive, he must combat the disease with all his means.

"If, however, it may be desirable to cauterize abrasions or excoriations, the injudicious and continued use of escharotics may be fraught with great disadvantage, and caustic may act as an irritant, preventing the healing of a sore.

"This is often witnessed in patients who think that they can treat their own cases, and following, as they believe, the surgeon's plan, employ nitrate of silver most bountifully. Great pain is produced; a deep eschar comes away in the course of a few days, the irritability of the organ is greatly increased; and, being unable to uncover the glans, the patient now seeks the assistance of his surgeon, who, after carefully examining the parts, finds the original sore re-inoculated, and perhaps several other small ones in the neighbourhood. These cases clearly show that the employment of caustic, in injudicious hands, may often do more harm than good; that while the nitrate of silver destroys the virus of one sore, the irritation it produces prevents us seeing the mischief accruing to others; and probably the non-observance of these rules has led to caustic being very much abused. Before we employ nitrate of silver, the part should be carefully cleansed, by being soaked in warm water, as the virus may exist on the surface of the neighbouring skin, and, if not washed off, will re-inoculate the sore when the little eschar falls, and undue blame will be thrown on the caustic. Although, then, no other ulcer exists at the time of using the escharotic, still another sore, or little pustule, frequently, in a few hours after, will be met with, which, if precautions be not taken, will go on increasing, and the disease will spread rapidly. These circumstances explain several anomalies which have thrown discredit on caustic. The parts should now be carefully dried; and if it be an excoriation the surgeon is called on to treat, the skin should be put on the stretch, and the solid stick of nitrate of silver lightly passed across it, so as effectually to whiten the surface in its entire extent. All cracks and crevices must be treated in the same way, and dry lint applied for the next eight or twelve hours after cauterization.

"Should the surgeon be called upon to treat chancres at the orifice of the prepuce, presenting the appearance of cracks, he must draw back the prepuce gently, and he will be enabled to cauterise the entire extent of the chancre; but, in repeating the operation, let him take care not to rupture the cicatrix, or this linear chancre will extend. The same observation applies to treatment of chancres on the frænum. To obviate the difficulty of healing such ulcers, I usually divide the frænum, and cauterise the whole of the cut surface. Without these precautions, it may be weeks before you will heal such sores. Reliance must not be placed alone on caustic and previous ablution, but extension of the disease should be stayed by lotions of an astringent kind. The one I prefer is a solution of pure tannin, in the proportion of two grains to the ounce of water, which not only checks the discharge, but seems to tan or harden the skin. The private patient, however, should be told that this solution slightly stains his linen with a brown mark, or the lotion may tell tales to the family. To obviate this, a weak solution of sulphate of zinc may be employed, or, if desirable, dry lint; but dry lint has the objec-

tion, in some instances, of irritating the part, and prevents the little eschar falling, thus preventing us from re-applying the caustic.

"We now come to consider how soon the caustic should be re-applied. The rule I follow is, to employ it as soon as the eschar is removed, and this will vary in many cases; generally speaking, it is sufficient to cauterise once in twenty-four hours, particularly if the sores be numerous or large. More frequent applications might be useful, did they not produce irritation; and, should swelling of the prepuce arise, the mischief will be greater than by allowing the disease to run its course, as, in the latter case, we should be unable to employ ablution. Before removing the lint, let the part be well soaked, or the little eschar may be detached.

"If, however, nitrate of silver is useful in abrasions and excoriations, reliance should not be placed upon this escharotic in severe cases, or where pustules or ulcers are formed. Experience teaches us that this salt is not sufficiently potent, its action being confined too much to the surface, and repeated applications are necessary, which may be oftentimes inconvenient. Whenever, therefore, the surgeon is called upon to treat a pustule which he suspects to be a chancre, let him open it, remove the pus with a point of lint, and fill the little depression with Vienna paste, or cauterise it with the solid lime and potash caustic. In cases where a scab covers the ulcer, the former must be first removed: this is readily done by a poultice or water-dressing, and then, after carefully washing the surface, a layer of one or other of the above-named potent caustics may be placed on the sore, and allowed to extend a little beyond the margin of the ulcer.

"The application of the escharotic is, of course, followed by considerable pain, which gradually goes off; the sore, however, should be exposed until the eschar is dry, or the paste would act on any part it comes in contact with. This eschar falls in due course, and leaves beneath it, generally speaking, a cicatrised spot, or a healthy sore, which has lost its specific action, and heals in a few days under a mild astringent wash.

"Cauterisation, however, will not be found of the same efficacy in very large ulcerations, nor have we seen such favourable results when sores are situated on mucous surfaces, or where they are kept damp; in these instances, the abortive treatment does not succeed. Furthermore, the escharotic is not generally applicable in chancres attended with inflammation. Experience proves here, as elsewhere, that although nitrate of silver may be useful in allaying irritability, and in curing subacute inflammations, its employment in acute inflammatory attacks is very doubtful, or, at most, useful in but a very few instances; and though surgeons may derive great benefit from its employment in chronic ophthalmia, in scrofulous constitutions, and in subacute inflammation of the urethra, few, if any, recommend it in acute affections of these organs, unless in the single exception of erysipelatous affections of the skin, in which it has been, like many other applications, much vaunted, and subsequently laid aside. When chancres are attended with acute inflammation, caustic will be worse than useless. Experiments prove that phagedæna destroys the virus, and they likewise show us that caustic often increases instead of allaying inflammation; therefore when

the latter is present, recourse must be had to opium, rather than to nitrate of silver, as I shall show when treating of that variety of chancre.

"But it is not alone in acute inflammatory chancre that we must lay aside the use of caustic; we should never apply the salt when previous applications have irritated the sores, or we might continue its use *ad infinitum*, without healing the ulcer."

Another counter-indication to caustic, is induration of a sore; if it be applied in these cases, great pain will be produced, the sore will become irritable, and gangrene will often follow. In simple cases, Mr. Acton recommends no constitutional treatment and argues strenuously, and we think with good reason, against the use of mercury.

Inflammatory Chancre is usually met with in young plethoric men, who live high. If it be not treated by active depletion, it may readily terminate in gangrene. Where this occcurs, the specific nature of the virus is destroyed, and secondary symptoms never follow. A saturated aqueous solution of opium is the best local application, and opium internally, and in full doses, is generally necessary.

Phagedænic Chancre often occurs in anæmic, irritable, dissipated subjects. It presents the following appearances:

"The phagedænic sore may vary in size from that of a pea to a crown piece; usually it is superficial, rarely extending deeper than the subcutaneous cellular tissue. The shape is more or less round, but still irregular; the edges, of a brownish hue, are usually undermined, and the disease has a tendency to burrow, particularly if position assists it. The base of the sore is somewhat swollen, not, however, indurated; the surface is uneven, covered with little eminences and depressions; presenting here and there attempts at cicatrisation; a more or less adherent yellow matter covers the ulcer, which it may be difficult to remove, or which comes away in shreds. Granulations are altogether absent; or, if any exist, they are observed to be pale, few in number, transparent, and swollen, looking like vesicles; more frequently, however, the surface is of a greyish yellow colour, interspersed here and there, with little bloody points or reddish lines. The pus is thin and offensive, holding in suspension the detritus of the tissues and flocculi of pultaceous matter; it is inoculable during the progressive period. The ulcer rarely extends, however, beyond the subcutaneous cellular tissue. It may last a long time, and cicatrisation may be much retarded.

"It is not uncommon to see, on the surface of phagedænic ulcers, a species of ecchymosis and sphacelated spots. There is pain, of a peculiar stinging, smarting kind, which keeps the patient very restless. The general symptoms seldom run high; the fever is rather of an adynamic kind; there is often prostration of the vital powers; in advanced stages of the disease, the appetite is lost; there is pain in the head, palpitation, neuralgic pains, and a peculiar unhealthy hue of the skin; various eruptions may appear, either around the sore or on the body; these may consist of ecthyma, eczema impetiginodes, or rupia, all of which have been and may be mistaken for secondary symptoms. The debility and general prostration of the animal powers gradually increase, and the patient, unless relieved, gradually sinks, worn down by diarrhœa and colliqua-

tive sweats. M. Ricord states he has found ulcerations in the intestines, in cases in which he has had an opportunity of performing post-mortems."

In these cases, mercury is most injurious, but the greatest benefit will be derived from *iron*. Mr. Acton uses the tartrate, but probably any other form would answer as well.

In *Sloughing Phagedæna*, Mr. Acton has most confidence in opium given freely in large doses. Destruction of the surface of the ulcer by nitric acid is also useful in some cases.

[For the *Indurated Chancre* mercury is indispensable, and it should be continued as long as any induration remains. The hardness may not be at first specific, but merely the result of irritation, and if so, may disappear under simple application. If the hardness persists, however, the mineral must be given.

Urethral Chancre is the cause of *virulent* gonorrhœa, hence its existence explains those cases which have led to the opinion of gonorrhœa being capable of producing secondary symptoms. In all doubtful cases, inoculation must be practised to clear up the diagnosis.]

Syphilitic Cutaneous Eruptions may all be classed under the following heads: exanthematous affections, vesicular, papular, tubercular, pustular, and ulcerations.

Roseola is the common form of the first, and is often confounded with a similar eruption caused by the administration of copaiba, which disappears whenever the drug is omitted; and also with a form of *pityriasis*. In arriving at a diagnosis in this latter case, Mr. Acton is determined by the co-existence or absence of condylomata, psoriasis palmaris, and sore throat.

Syphilitic vesiculæ are exceedingly rare. Where a patient presenting an eruption of this kind appears of good constitution, the vesicles being distinct and the intervening skin healthy, the disease is not syphilitic.

Lichen is the usual form of papular eruption: our author believes that both lepra and psoriasis are merely modifications of it.

"Those who have specially written on skin diseases, have, as it appears to us, rendered more difficult an acknowledged difficult subject; they have attempted to create distinctions between *lepra* and *psoriasis*, which, in our opinion, are both terminations of a papular eruption. The *lichen* above described may become dry at its summit, scales may form, fall off, and be reproduced, and this process may gain the base, and extend itself in an irregular manner, constituting what authors call *psoriasis*. On the other hand, the base of the papule may become scaly, the centre or apex remaining in a natural condition; the result is that a circle is formed of these little scales, surrounding and surrounded by healthy skin; and as this circle is somewhat prominent, from a slight swelling of the dermis now secreting the scales, it has been considered sufficiently characterised to be termed *lepra*. On the same individual *lichen, psoriasis*, and *lepra*, may be seen: and we may here observe, that the little white border, described by M. Biett as characteristic of the syphilitic affection, is often wanting."

In the diagnosis he again relies on the same indications as in the exanthemata.

In the treatment, he strongly recommends mercurial fumigations, and we can bear testimony to the value of the plan. The following is the method of administration:

"The patient, having undressed, is seated naked on a chair in a large box, his head being the only part exposed to the air. This box is heated by a furnace, on which the bisulphuret of mercury is placed, in the proportion of three drachms for each vapour-bath. The intense heat applied soon volatilizes the mercury, which quickly fills the well-closed chamber or box with a leaden-coloured vapour that condenses on the body of the patient, who is exposed to its influence for twenty minutes, during the last ten of which he perspires profusely. The box is then opened, and the surface of the body is gently wiped, so as only to remove the drops of perspiration: a gown is now thrown over the body, and towels twisted round his legs, and the patient laid on a bed, thus swaddled up, between two blankets, which are tucked carefully round him, and additional coverings added. The patient is now left for half an hour, during which he perspires freely, and a glass of toast and water may be given. At the end of this time, the wet clothes should be removed, and the patient thoughly rubbed down; after dressing he should not at once expose himself to the open air, but remain a short time in a cool room. The vapour, thus administered, may be repeated two or three times a week, for a month or five weeks, and a cure of some of the most rebellious forms of secondary symptoms may be attained. It may be readily assumed that this treatment is one that cannot be easily carried into effect in the country, as the necessary conveniences are not at hand. In these instances, the vapour-bath may be had recourse to, and the cinnabar may be placed on a metal plate over a little charcoal furnace; but, from some experiments which I have instituted, I find that the mercurial vapour is so heavy, that it will not usually rise more than a foot, and the good effects of fumigation will be slight, as compared with those arising from the real fumigating apparatus. The body should be covered with a dark powder when the apparatus is well applied, and gold leaf will detect the presence of mercury on every part of the body. The above remarks, perhaps, explain why fumigations have fallen into disrepute, as the proper means of application are not always at hand."

Mr. Acton does not believe that condylomata are inoculable. As local treatment, he recommends a solution of chloride of soda as a lotion to bathe the parts twice a day; the parts should be well dried, and calomel be sprinkled upon them, and dry lint kept between the excoriated surfaces.

Under the head of pustulæ, he includes rupia, bullæ, and impetigo of the scalp. He finds the emplastrum ammoniaci cum mercurio an admirable local application.

In the local treatment of alopecia, Mr. Acton recommends stimulating washes, as, equal parts of rectified spirits, eau de Cologne, and castor oil, or, if a stronger one be required, equal parts of vermy water and tinctura lyttæ, some pomade being used also.

The throat is very frequently the seat of secondary symptoms. Patches of erythema appear, which become prominent, and then pale in the centre, extending in size. They are often of a circular shape, or like the

figure 8; they frequently ulcerate; their most common situation is on the tonsils, the sides of the tongue, or near the frænum; they are met with less frequently at the corner of the mouth, and on the dorsum of the tongue. Generally the patient has other secondary symptoms at the same time.

Syphilis in Infants.—What is said on this subject deserves attentive study; we can merely indicate the points which Mr. Acton argues and illustrates. A woman may contract syphilis during the time she is pregnant, and infect her infant, the father being healthy; but the latest period at which this may occur is not ascertained. A man labouring under secondary syphilis may beget an infected infant, the mother remaining free. A mother labouring under syphilis may suckle her child without giving it the disease. Mr. Acton does not believe that a nurse labouring under secondary symptoms can infect a child. He thinks that an infected fœtus may contaminate the mother, and relates a case, which, however, is not conclusive. Mr. Acton does not believe that an infected infant can contaminate the wet nurse.—*London Journal of Medicine, August,* 1851, *p.* 709.

132.—*On the Iodide of Potassium in Syphilis.*—[The following remarks upon this subject are made by the Reviewer in the 'British and Foreign Medico-Chirurgical Review.']

Dr. Williams was the real discoverer of this influence, perhaps the greatest therapeutical discovery of the age, after that of the anæsthetic effects of ether and chloroform. His paper was read at the College of Physicians in 1834, five years before Ricord began his experiments; and so far from giving it indiscriminately in all cases, he took the greatest pains to investigate its real powers, and pointed out where it was efficacious and where useless; not with hesitation, but with all the open candour of his nature. In his 'Elements of Medicine,' while showing the marvellous certainty of its action in rupia and the hard periosteal node, he showed that its power was much less in roseola, purpura, and ecthyma, but still it was better than mercury; while, in lichen, lepra, psoriasis, and iritis, he proved, with equal clearness, that mercury, either locally or generally, had far more beneficial influence than the iodide. He pointed out the curious fact, that while the action of the iodide on *hard* periosteal node was as certain and evident as that of quinine in ague, when once suppuration had commenced, sarsaparilla was the remedy, the iodide being useless. In soft node and prurigo, he showed the true power of sarsaparilla; and in syphilitic angina and rupia, the invariably good effects of combining local mercurial applications with the internal administration of the iodide.

We witnessed many of his experiments, and for the last twelve years have been guided by his results, without having ever had cause to regret it; and after tolerably extensive opportunities of treating secondary symptoms, the only modification we have learnt to make in his practice, is the occasional use of the protoiodide of mercury in lichen and in some of the affections of ligaments and synovial membranes. We almost always give

the dose recommended by Dr. Williams, eight grains three times a day in water or camphor mixture; and when using the protoiodide of mercury, begin with one grain daily in divided doses, increasing gradually to three or four grains in the day, made into pills with liquorice, or with catechu, if it acts on the bowels. Opium appears to destroy its power altogether. We never saw any good done by giving a mercurial course before the iodide, as many recommend, but often much harm. On this point, and on the relative powers of iodide of potassium and mercury in syphilis, we would refer to a work in which the investigation has been made in the true spirit of science by Dr. Hassing, of Copenhagen. A notice of this book, and an abstract of some of the important results, will be found in Vol. XX, 1845, pp. 482-6.—*Brit. and For. Medico-Chirurg. Review, July*, 1851, *p.* 201.

133.—*On Bubo.* By JOHN L. MILTON, Esq.—[Mr. Milton endeavours to show, that "bubo is curable in most cases without surgical interference, and in all without cutting or disfiguring the patient."]

The remedy upon which Mr. Milton relies is tartar emetic, given in grain doses every second hour, until a marked effect is produced upon the inflammatory swelling. This mode is very efficacious; but many patients, we think, would prefer the bubo to the medicine.

Mr. Milton, moreover, is of opinion, that, when tartar emetic fails to check suppuration, punctures, not leading directly to the sac, should be substituted for incisions, and thus deformity and the exposure of a large suppurating surface to the air be prevented.

Our readers are probably aware, that a large proportion of venereal buboes, even those which have suppurated, disappear under proper general treatment, combined with rest, without surgical interference; that those which burst heal readily like any other abscess, provided the patient's health be good; and those which are opened by vertical incision heal very readily. But surgeons are slow in opening a bubo without a reason, partly because it may disappear without such a measure, and partly because all abscesses which burst of themselves, as a rule, do better than those opened by the knife.—*Med. Times, October* 4, 1851, *p.* 353.

134.—*Chronic Gonorrhœa, or Gleet.*—The chief point of interest in this section, is the view put forth by Mr. Acton, that the cause of gleet is the existence of a granular condition of the mucous membrane of the urethra, analogous to that which the speculum reveals in the vagina, in cases of old standing discharges. In the treatment, he examines the passage by a wax bougie, No. 6 or 8. If an irritable unequal surface be detected, he uses the strong caustic injection, and gives copaiba or cubebs; following up by injections of zinc and tannic acid. If incipient stricture is detected, the nitrate of silver is not advisable; but bougies should be passed every other day, astringent injections being used in the intervals. —*London Journal of Medicine, July*, 1851, *p.* 647.

135.—*Chloroform in Gonorrhœa.*—M. Venot recommends injections of chloroform as an *abortive* treatment of gonorrhœa, that is to say, of arresting it in the earliest period of its development; and thinks that it will replace the nitrate of silver, which is so frequently employed for this purpose. Pure chloroform is injected by a glass syringe, the perineum being pressed upon; the first effect is burning heat, then a sensation of cold follows. The injection does less good after the first two or three days of the gonorrhœa have passed; but, employed before that time, it almost invariably arrests it. Injected into the vagina, the results were less satisfactory.—*L'Union Méd.*—*Med. Times, April* 19, 1851, *p.* 433.

136.—*Balanitis, or Gonorrhœa Preputialis.* By W. Acton, Esq.—[This disease consists in inflammation and patching excoriation of the glans penis and lining of the prepuce, accompanied by a muco-purulent discharge. The predisposing cause is the existence of the prepuce. The exciting cause is generally the application of some irritating secretion; abscesses close to the frænum, or gangrenous prepuce. Chancre and eczema are frequent complications.]

The treatment of the uncomplicated disease is very simple: it consists in washing the parts, carefully drying them, and by means of dry lint, accurately placed between the glans and prepuce, separating the two surfaces. If a slight inflammatory condition of the parts exist, it will be well to pass a stick of caustic over them, simply to whiten the surface, which should be previously dried by lint. The affected parts should be washed twice daily with a lotion of zinc and tannin, one grain of each to the ounce, then dried, and lint applied as before. When phimosis exists, lint wrapped round a probe should be carefully introduced between the glans and the prepuce, to wipe away all secretion; the prepuce then being gently drawn forwards, a solid stick of nitrate of silver may be introduced and brushed quickly over the surface, warm water being afterwards injected; or a strong solution may be injected, instead of using the solid caustic. If the phimosis be irremediable, the operation of circumcision must be performed. The following is Mr. Acton's method: "Without employing any traction, I trace in ink a line on the prepuce, which follows the circumference of the base of the glans, and is a little in front of it. This being done, the prepuce should be drawn forward and fixed between the blades of a pair of dressing forceps placed in front of the glans, and behind the line of ink traced on the prepuce; let the forceps be then held in this position by an assistant. Let that portion of the prepuce which is in front of the forceps be now drawn forwards by the left hand of the surgeon, while, at the same time, he with the right divides it in the oblique direction of the forceps, which thus protects the glans. In this operation the skin alone is removed, the mucous membrane is not drawn forward with the skin, and remains intact; if we do not wish to see the phimosis recur, this portion of mucous membrane must be removed. To effect this, I employ a pair of scissors, slitting up the thin layer of mucous tissue as far as the base of the glans; the two

portions should then be successively held apart by a pair of forceps, and removed by dividing them at the base of the glans, as far as the frænum, which is divided the last. I generally employ torsion of the arteries in these cases, to check the bleeding; lint dipped in cold water is then applied, and it may be advisable to administer an enema containing opium in the evening, or to prescribe camphor pills to prevent erections. A perfect cure takes place about the twentieth day, and the result is very satisfactory; there is no deformity, nor have we to dread a consecutive paraphimosis.—*London Journal of Medicine, July*, 1851, *p.* 645.

137.—ON CHORDEE.

By John L. Milton, Esq.

[There are two facts to be noticed as to the cause of chordee as bearing upon the treatment; viz., that there is spasm, and that this is attended by pain, caused, primarily or secondarily, by the condition of the mucous membrane. The following appear the best known and most commonly employed methods of treatment:]

Mr. Lagneau says, "for the inflamed chordee, bleeding from the arm, hot bathing to the perineum, lavements, eighteen or twenty leeches to the canal of the urethra, two or three times repeated, and, when the pain is severe, gr. i. of the watery extract of opium, and gr. ii. of camphor," which he recommends giving in the evening. He winds up this energetic treatment by a solemn warning not to plunge the penis into cold water, as it may be, and has been, followed by a metastasis of the complaint of the bladder.

M. Ricord recommends gr. iiss. of camphor, and gr. ss. of opium in a pill, of which two or three may be taken every night.

Richter recommends that the patient sleep on a hair mattress, and very cool, or else on a canopy, and do not turn on his back. Eisenmann that the parts should be exposed to the influence of narcotic vapours; or that infusion of camomile or cherry-laurel water be injected or dropped into the urethra. He found sedatives of no avail. He recommends the patient to make water more frequently than necessary, because a distended bladder irritates the vesiculæ seminales and the neighbouring parts. He objects, also, to dipping the penis in cold water, and then recommends soothing injections, or poultices; opium being less useful. Peyrihe recommended ammonia and injections of soap ley. Iodine, the empyreumatic oil of tartar, and blue ointment, have also been praised.

Mr. Hunter says, "he has known twenty drops of the tinctura thebaica take it (painful erection) away for a whole night, and that the cicuta has likewise some powers in this way." For the chordee, he recommends opium joined with camphor, praises local bleeding with the free use of hot vapour to the parts; poultices with camphor; while the effused lymph which remains may be removed by mercurial ointment in friction. He has seen the cicuta of service.

Mr. Wallace recommends calomel and hippo*, with opium and camphor.

* Pulv. ipecac. comp.

Such are the general outlines of the practice pursued by surgeons, as we find it recorded in books. These plans bear a pretty strong resemblance to each other, and are nearly all calculated to lead to one point—the allaying of pain by the use of sedatives. The idea of attempting to remove it by the pure antispasmodics, does not seem to have been worked out or even entertained, although everything seems to show that it is more amenable to them than to opium. I will add but one more remedy, as remarkable for its originality as any I know, and which was, I believe, first recommended in writing by Dr. Colles. It is, that when the patient finds the chordee coming on, *he do turn over, and balance himself on his knees and elbows till the chordee goes off*. The reader can easily imagine what effect such a remedy would produce. Let him figure to himself an exasperated patient struggling in the middle of the night to get ease in this way! Verily, this is surgery!

I now approach that part of the matter which has most of all occupied my attention—the substitution of some simple and always applicable remedy for these different methods of cure. I will not stop to point out the inutility or inapplicability of antiphlogistic treatment to this symptom, as any one versed in the disease must have observed cases where the chordee came on though the patient had been treated most heroically. Sedatives I utterly object to, as I have never used them in sufficient quantity to have any material effect on the chordee without finding the patient much worse afterwards. They generally disordered the stomach, produced headache and langour, very often with constipation of the bowels. The scalding and discharges were rendered worse and more obstinate, and, to crown all, the chordee was merely abated for an instant, and returned the moment they were left off; nay, even when they were again administered without increasing the dose. Nor have I ever been able to understand why they should be given, as the pain appears to depend on a spasm, and when this is removed the pain ceases; whereas, the spasm does not necessarily subside when the pain is relieved.

I have tried the most powerful anti-spasmodics, as ether, galbanum, assafœtida, and chloroform, and can only say of them that I have found nothing equal to camphor in the fluid form. In powder, camphor is disagreeable to take, and did not appear to act so readily, I suppose from not being so equally diffused and finely divided as in solution. In fact, in spasm a liquid remedy, as admitting of a more rapid action, is always the thing to be sought for. The spirit of camphor, taken in the dose of ʒj., in a small quantity of water, is equally energetic and rapid. The objection that it immediately becomes insoluble by contact with water, is sufficiently obviated by the fact, that its operation is most certain and rapid, and that essence of camphor, in which the camphor is so dissolved that it does not separate on the admixture of water, possesses, so far as I have been able to judge, no advantage over the other.

As in many other cases, the chain of morbid actions must at once be broken, and this is done much more effectually by two or three full doses, repeated at short intervals, without the least remission, till the chordee is completely stopped, than by small quantities, however long continued and regularly taken. I therefore invariably adopt the following plan:—

A teaspoonful is to be taken at night in water before going to bed, and

every time the patient wakes with the chordee, let him at once rise and repeat the dose. In the milder cases, one dose for a night or two is generally enough. In the more severe ones, the symptom is generally removed at the end of the second night, becoming, in the mean time, milder and less frequent after each dose. So long as the clap remains bad, I frequently recommend the patient to take a teaspoonful at night, before going to bed, which suspends the chordee till the cure is completed. This plan of treatment also answers well in the bearing down pains to which women are sometimes subject in clap; but as here, contrary to what it is in men, these pains are generally worst in the daytime, it is best to use the essence of camphor largely in the medicine they may happen to be taking.

It must, however, be taken in full doses. A violent sudden pain like that of chordee, requires an equally powerful remedy, and there is no use in trifling with it. A less quantity than a teaspoonful will not always suffice to abate the pain at once, though it may materially alleviate it; just as a moderate dose of chloroform will lull the acute pain of an operation without rendering the patient insensible to what is going on, while a smaller quantity, in one full dose, produces complete torpor. Now, as a teaspoonful or two may be safely taken, it is best to insure success at once. In one or two cases, it has produced some sickness, and, strangely enough, this has been more the case with small doses than large ones; this was probably caused by something having been previously taken that had in some measure disordered the stomach. At any rate, the instances have been too few to make the affair of any moment. I only allude to it here, that no one might by its appearance be discouraged from giving so valuable a remedy as camphor really is.

The patient should be directed to keep the camphor in a tightly-corked bottle, and in a cool place, and to have it by his bed-side ready to take. It is best taken in water, as, if dropt on sugar, it produces a strong sensation of heat in the mouth, occasionally preventing the patient from getting to sleep again.—*Med. Times, July* 19, 1851, *p.* 66.

138.—ON BLISTERING IN GLEET.

By John L. Milton, Esq.

[In refractory cases of gleet Mr. Milton proposes to revive or introduce the practice of blistering the penis. Although little known or used, he states it to be the most powerful remedy that can be applied. He says:]

Not merely will a single blister frequently cure the most prolonged gleet,—not merely will it rapidly sweep away all dregs of the disease in in its ordinary course, but it will often cure those runnings which have resisted all known and used methods. I have seen two blisters, with a mild injection or two, at once cure a clap which had defied the most energetic treatment; and *as I never found a case which resisted blistering and injections together, that was not complicated with stricture or affection of testicle,* I am slowly arriving at the conviction, *that every case of clap or gleet, however obstinate, may, if uncomplicated, be cured by blistering, singly or combined.*

To illustrate and urge forwards this operation by every means in my power,—to invite attention to it, that it may be put to the severe test of practice, to attest it by cases which I have collected and watched,—to point out the necessity of quitting the beaten paths of treatment, and try a new remedy more powerful than those in use, is the object of this paper. But as so many remedies have fallen into disuse from the indiscriminate use or mis-application of them, and as so many which are in favour have been arrested on their path by obstacles issuing from the same sources, I must here enter my protest against being supposed to recommend blistering in gleet, unless properly applied, and in the cases I have referred to.

In order that a blister be properly applied, there are some points which, however trifling they may seem, require as much attention as the leading features of the case. Where these are neglected, blistering is apt to produce such a filthy excoriated mass, that the patient will not submit to it a second time: whereas, if carefully laid on and dressed, it is, from its being out of the reach of friction in the ordinary movements of the body, even less troublesome than if on a limb or the trunk. Before putting it on, the hair at the root of the penis is cut off, and, if the foreskin be naturally retracted, it must be drawn a little forward over the glans. A piece of paper is then to be fitted on the penis, and cut till it exactly covers it from the root to within half an inch of the mouth of the urethra. This is then laid down on the blister, which is cut out by it, wrapped round the penis, and fastened with threads behind the glans and near the root. The patient should remain perfectly quiet during the time it is on, lest any motion should bring the the blister against the scrotum, and vesicate it; but he must not apply it on going to bed, or he will most likely fall asleep, and not awake till the penis is one mass of vesications,—a state productive of an unnecessary amount of suffering.

In the milder cases, or where the skin is tender, an hour or an hour and a half will be sufficient. The blister is then removed; if there are any vesicated spots, they are covered with pieces of linen spread with zinc ointment, and then a layer of cotton is bound over these, and covered with a piece of linen, kept on by a thread, or, what is better, two very thin rings of vulcanised Indian rubber.

Where a severer case renders a more energetic employment of the remedy necessary, it must be kept on two or four hours, until free vesication is produced; zinc ointment is then applied. To protect the penis from friction, a T bandage, with a linen bag sewn into the part which receives the penis, or a handkerchief carried round the waist and dipping in front so as to receive the penis and keep it up against the abdomen, is necessary.

The first effect of this application is to increase the discharge considerably, which then terminates either by altering its character, becoming ropy and mucous, and finally disappearing in a few days, or by remaining somewhat more persistent and requiring a few injections, when the penis is so far advanced towards healing that it can be handled without pain, or demanding even a second blister. One of the most cleanly and convenient, and least painful forms of blister, is Brown's blistering

tissue: it causes much less irritation, and heals much more quickly than the ordinary blister. The blistering fluids, if strong enough to vesicate, caused such pain that I soon renounced the use of them.

How does this remedy act? By counter-irritation will, perhaps, be the answer. But, if this were the case, why should there be increased action in the urethra for a few days, and why should the discharge from the urethra begin to disappear when the counter-irritant surface is healing up? It would seem as if the organized constituents of the urethra are capable of keeping up a certain amount of overaction for an indefinite time; but that when hurried beyond this by a healthy stimulant, *a rebound* takes place, which leaves them less capable than before of furnishing a secretion, morbid in amount or in quality, or in both. We see something similar in prurigo pubis, where a blister causes an exacerbation of the symptoms, succeeded, however, in some cases, by a healthier state of the skin; in bubo, treated by a blister, &c.

The cases which now follow have been selected from among many, with a view of showing the applicability of the remedy, not merely to a variety of cases, but under a variety of circumstances, which, in practice, are not less to be considered than the nature and duration of the disease itself.

Case 1.—*Slight Acute Gonorrhœa.* A. B. applied to me, February 28, with gonorrhœa, which he had had four days, and which was treated with salines, there being some feverishness present. On the 5th of March, there being no improvement, a blister was applied, and some sulphate of magnesia was added to his medicine. On the 12th he came again; the cure was complete.

Case 2.—*Slight Acute Gonorrhœa.* Joseph G——n, contracted gonorrhœa, March 11, 1850; there was no chordee or painful erection, and only slight scalding.

14th. Saline powder every morning.

19th. The scalding continues, the discharge better. Soda and jalap powder to be taken twice a day.

21st. The scalding continues. To go on with the powder and use a zinc injection, ʒi. ad Oj.

26th. The scalding gone, the injection has relieved him most of anything.

April 6th. He returned to day as bad as at first, and was then blistered.

13th. Every trace of the discharge gone. I saw him some months after; he had remained quite free from any discharge.

Case 3.—*Protracted Acute Gonorrhœa.* John I., applied April 10th, 1850, with a running which he had had for six months; there was a free discharge attended with pain and scalding, and he seemed very weak.

Mist. ferri c. ℥j.

Dec. aloes c. ℥ss.; mix and take three times a day.

12th. The medicine agrees with him, but there is not the slightest alteration in the discharge. He has long used injections, etc., without any benefit, and as he cannot attend regularly, I have ordered a blister to be applied to the penis.

15th. The discharge is almost gone.

To have two pills of turpentine and strychnia every night and morning.

19th. He has not had any discharge since his last visit.

Case 4.—*Protracted Acute Gonorrhœa.* Mr. D., a healthy man, applied to me Oct. 15th, 1850, with a clap, which he had had five months. He had taken an immense quantity of copaiba, purgatives, &c.; but, in spite of all this, the disease was always coming on again as bad as ever. However favourably it might promise for a few days, it was sure to return. He asserts that he took the medicine exactly as it was ordered, notwithstanding the great aversion he has to copaiba, &c. When I first saw him, he had little chordee or scalding; but there was a very free, thick, purulent discharge. He had used strong nitrate of silver injections, which gave him excessive pain, but produced no beneficial effect on the progress of the disease. He never subjected himself to any great restrictions in diet, and it would appear that he and his surgeon somehow or another, never carried out very consistently any plan of treatment; for when the patient was getting well, the medicine was left off, as if both were tired of it. Sometimes it was suddenly changed, and then the old copaiba mixture was resorted to, apparently without any particular reason; sometimes the patient proposed a medicine, which was forthwith accorded him; at last he came to me.

Finding his stomach much disordered, I prescribed liq. potass in bitters. This was immediately followed by an increase in the scalding, to check which the acet. of potass was substituted, and calomel and ipecacuanha were ordered at night. At the same time, I injected him with chloride of zinc, and he himself, two or three times every evening, used the acetate and sulphate of zinc in injections; but the painful erections, constipation, pain on making water, went on unabated. On the 21st, he was suddenly attacked with irritability of the bladder, and all medicines were suspended, except the use of ether and camphor, which, with hot bathing, seemed to afford him some relief. On the 31st, all symptoms of irritability having passed off, the calomel and ipecacuanha, with the acet. of potass were recommenced, and caustic suppositories were substituted for the injections. He also went into the country, but grew worse, though he lived very regularly.

On the 8th of November he began using the camphor, to check the erection, which had become latterly nearly as bad as ever. The discharge was unchecked.

To be blistered.

10th. The blister was kept on three hours and a half; it was followed by a free discharge from the urethra. In all other respects he is better.

12th. The soreness of the blister is so far abated, that injections can be used. To have the sol. of chloride of zinc, and nitric acid and bark.

13th and 14th. The discharge now rapidly decreased; the erections and scalding have quite gone away.

On the 15th no discharge was to be seen, nor had he noticed any on rising that morning. He was in high spirits. To continue the injections.

19th. On squeezing the urethra, a very little discharge, somewhat

like whey was seen. There was no scalding or erection; but the urethra when pressed felt like a rigid tube, as if in a state of permanent spasm, so that I was disposed to regard this disappearance of the discharge as treacherous. Meanwhile, his general health continued pretty good, and though he worked hard, he was very abstemious.

On the 22nd the injection, which had been continued, produced more pain than usual; and on the 24th a little discharge was again seen. The injection was made milder, and on the 25th it had disappeared.

On the 28th he, for the first time, took a quantity of beer, the immediate effect of which was the re-appearance of the discharge, which, by the 3rd Dec., had again become thick and purulent.

To be blistered again, but to continue in other respects the same. No alteration in diet.

Dec. 6th. After putting on his blister, which he kept on three hours and a half, he found the discharge at once disappear, and has since remained free from it.

On the 16th I saw him again; he had seen no discharge at all since, though he had continued to drink beer, and have connexion with women.

In the spring of the year I saw him again, when he gave me the same account.

Case 5.—Clap, Relapse, Cure. W. J. has now, Feb. 1, 1850, had clap three months, for which he tells me he has taken "all manner of physic." It is purulent, and accompanied by pain on erection, scalding, &c.

To take the saline powder, and use a zinc injection, ʒj. ad Oj.

March 8th. Though progressing, he is not so well as might be expected; he looks pale and bloodless.

To continue the injection, and take the red oxide of iron, ʒss. ter die.

On the 12th, I began injecting him every morning, and by the 19th the discharge was gone. On the 21st it re-appeared, thick and purulent, and accompanied by great irritability of the bladder, which I partly ascribed to his having drank some beer, and allowed his bowels to become constipated, and partly to the dull, dusty weather. He was ordered a blister to the penis, a strong sulphate of zinc injection, and a saline mixture every four hours, with ʒiss. of sulph. of magnes. in each dose.

22nd. The blister was kept on four hours, and has risen freely; there is no discharge from the urethra, and he feels much better. All pain and uneasiness are gone, and his bowels are freely open.

To go on with the mixture, and dress the blister with cotton wadding, not cutting open the vesications.

From this time there never was any trace of the disease to be seen; on three distinct occasions I have examined the penis, and found no discharge.

Case 6.—Gleet Alternating with Purulent Discharge.—Cure. J. B. Esq., applied to me, June 1, 1849, giving me the following detail of his case:—About six years before, he contracted gonorrhœa, and, having a deep-rooted dislike to medicines of all kinds, he only lived low, and endeavoured for about fifteen months to let it wear itself out; but, finding it was more likely to wear him out, he applied to various practitioners and

some surgeons of eminence, without any success, for the simple reason, that he never did what they told him. He tried copaiba capsules, sea-bathing, shower-baths, and, for a little while, the tincture of steel, but got no better. Sometimes there was a discharge of pus from the urethra, sometimes only mucus, but he was never free from it; and some surgeons thought he had a stricture; but he never would allow a bougie to be passed, so that the point remained uncertain.

At last a friend brought him to me. As he had still the old dislike to "physicking," I proposed to pass a bougie, and, if there were no stricture, to blister the penis, which he considered a "disgusting nuisance;" but, he said, if there was anything that could be done at once, he did not mind how painful, he would submit to it, "only he would not have instruments poked into his bladder for any one living." I painted the penis with blistering fluid, which immediately produced intense pain for half an hour, and ordered him eight grains of calomel in one dose. This had an instantaneous effect; the discharge went away, and re-appeared in a milder form. With great difficulty I managed to procure his attendance for a few days, during which I injected the urethra with solution of sulphate of zinc, and the gleet disappeared completely. I have often seen him since, and he tells me, that sometimes, when suffering from a cold or over-living, he has seen a minute point of mucus come from the urethra, but that, with this exception, he has remained well.

Case 7.—*Gleet.—Cure.* G. K., Hoxton, applied November 6, 1849, with a gonorrhœa, which had broken out six days previously. He was ordered a saline powder, to be taken three times a day. I did not see him again till the 1st of February, but I found he had continued the use of this powder, and had injected himself three times daily with sol. of sulph. of zinc. Finding that his clap had degenerated into a gleet, I ordered him 25 minims of copaiba and 15 of sp. terebinth. three times a day. The injection to be continued.

8th. He appears better. Continued.

21st. The clap still persisting, I ordered a blister to the penis, and ʒ ss. of the red oxide of iron three times a day. When seen on the 26th, he was cured of all the discharge. The powder was continued, and he attended regularly till the 1st of March, when no discharge having been seen since the date of the blistering, he was dismissed cured.

Case 8.—*Gleet.—Cure.* R. T., has now (August 28, 1849) had gleet for about thirty-six days; he has taken various medicines, but without any material benefit.

To apply a blister to the penis for four hours.

30th. The discharge increased very much by the morning after; but in a few hours disappeared, and has not since returned. Nothing can now be seen; the canal seems quite free from moisture, beyond the usual dampness peculiar to it.

He was not again attacked by it.

Case 9.—*Gleet of Four Months' Standing.—Cure.* W. H. applied October 18, 1849, with a gonorrhœa of three weeks' standing. It is not very severe, and up to the present moment, he has not taken any medicine for it.

To take the saline powder three times a day.

30th. He has taken the medicine regularly. There is now only a gleet, but it is accompanied by some scalding.

To have some soda and opium powder, and take two pills with turpentine and strychnia every night.

Feb. 26, 1850. Since the last date, he has attended very irregularly, sometimes taking his medicine, sometimes leaving it off—fancying his gleet was cured, and always finding it return. The tincture of muriate of iron was also ordered him, but had produced no great effect. He has now come for the purpose of being "cured in good earnest."

To blister the penis, and take ʒss. of the red oxide of iron three times a day.

28th. There has been no discharge seen since. To continue.

March 1. His bowels are confined; to have a purgative draught.

5th. He has seen no discharge since. To continue the powder, from which, he says, he finds benefit; he thinks he gains strength from it, which he greatly needs, being a railway carrier.

Nearly twelve months after, I again saw him; he had had no return of the discharge since.

Case 10.—*Gleet of Long-standing.—Cure Protracted.* C. H. applied to-day, Oct. 23, 1849, with gleet, which he has had five or six years, and for which he has tried all the usual remedies, as copaiba, injections, &c.

To blister the penis, and take the steel mixture ʒi ter die.

25th. Much better; the blister was kept on longer than I ordered, and is now discharging freely. The gleet is lessened.

He obtained a situation the following day, which prevented him from coming any more, drank beer, and neglected taking medicine. In the beginning of February, finding the gleet returning, he was tempted to try some "balsamic pills," but not deriving benefit from this, he again came to me. I found but a very slight gleet, and it appeared from his account, that it had never been anything like so bad since he put on the blister, but still the cure was not complete. He was therefore injected, first with sulph. of zinc, and then with nit. of silver, and took the mist. ferri c. three times a day. In a few days he was cured, and when I last saw him he had had no return of the disease.

Case 11.—*Gleet of Three Months' Standing.—Cure.* R. W. has now, October 31, 1849, had gleet for three months. He has been constantly under treatment, but has observed during that time no improvement.

To blister the penis, and take the turpentine and strychnia pills.

Nov. 7. He is going on well, the discharge being now much less.

To take the copaiba and turpentine, ♏xxx. of the former, and ♏xv. of the latter, three times a day.

17th. There has been no discharge since the blister healed.

Case 12.—*Gleet of Several Weeks' Standing.—Cure.* Mr. J. J. applied to me January 3, 1850, for advice respecting a gonorrhœa which he had had some time. He had tried to cure it himself, but was not succeeding according to his expectation. As he could not come regularly, I ordered him sulph. of zinc injections, and some saline medicines, to remove the feverishness and constipation under which he was suffering. On the 8th he was better, and was directed to continue his medicines,

and the same on the 24th, when the injection was made a little stronger. On the 5th of March, nothing remaining but a little gleet, he was put on the tincture of steel, thirty drops three times a day, and left off the injections.

March 20th. I now found that there was still some slight gleet, and the injections were therefore resumed; his bowels being costive, some aperient medicine was ordered.

25th. There is no discharge to be seen, but he says a portion about the size of a pea, and like curd in appearance, came away this morning from the mouth of the urethra. His bowels remain obstinately constipated, and he is fretful about the gleet never going away.

A strong injection, immediately followed by a blister to the penis. ʒj. of the pulv. jalap. c. every other morning,

28th. No discharge has been seen since he put on the blister. His bowels were acted on very freely by the powder on the 26th, and have remained costive ever since. He did not take the powder this morning, fearing it might act when he was out.

℞. Conf. sennæ, ʒij.; pulv. jalap., gr. x. Misce. fiat mass. omni mane sum.

April 2nd. The same report; no discharge has been seen since. Immediately within the urethra there is a white patch, as if there had been an ulcer.

6th. Complete cure. The white patch is still to be seen.

Case 13.—*Gleet of Two Years' Standing.—Cure.* E. S., a delicate, dissipated young man, applied to me Feb. 20th, 1850, with gleet, which he has had full two years. He has taken copaiba at different intervals, and has used injections, but has never once got rid of it. His health is out of order, his appetite bad, and his bowels constipated.

℞. Acid. sulph. dil., ♏x.; infus. quas. ℥j., ter die sum. Confec. sennæ, ℥j.; ferri. ses. ox. ʒij. M. sumat coch. j. min. omni mane. Zinc. sulph., gr. iv.; aq. distil. ℥j. Ft. inj. omni mane. utend.

Feb. 21. Very much better; the discharge is almost gone; the injection produced a slight tingling. Cont.

22nd. The discharge is gone, his bowels are open, and he feels better.

23rd. This morning a minute point of discharge, like albumen, can be seen on pressing the urethra.

The injection to be increased to gr. viii. ad ℥j.

25th. The last injection produced but very little tingling. He says there was some slight discharge this morning; but I can see none now. He is getting much stronger, and the confection keeps his bowels open. As he cannot come to be injected, I have ordered him a zinc injection to use three times a day. To continue the mixture and confection.

March 4th. Since his last visit he has occasionally noticed a speck of discharge; on opening the mouth of the urethra and looking in, a white blanched spot is seen; it looks as if the mucous membrane had been burnt by nitrate of silver. Bowels rather too open.

Not to take quite so much of the confection.

12th. There has been no discharge since, and there is none to be seen now.

15th. He has taken to his old habits again and got drunk; the dis-

charge has re-appeared. As he will not or cannot come regularly, I have ordered him a blister to the penis, and to take the mist ferri. c. ℥i. ter die.

22nd. He put on the blister when going to bed, fell asleep, and when he woke next morning his penis was enormously swollen and quite raw. "It had, however," he said, "done him a mighty dale of good, and drawed away a full half-pint of water."

To continue the mixture.

He now left me, considering himself cured, but in February, 1851, was once more a patient with acute gonorrhœa; up to the date of his fresh infection he had had no discharge since using the blister, though he had been very dissipated.

Case 14.—*Prostatic* (?) *Gleet.*—*Cure.* W. O. has now, March 5, 1850, been some time under treatment for gleet; there is great uneasiness and pain about the prostate, particularly on crossing his legs. The bladder seems also disordered, and micturition is accompanied by pain. After he has had a stool a quantity of glairy matter is thrown out of the urethra; it seems to be about a small tablespoonful in bulk. He has used injections, salines, &c., for twelve months, which have cured the gonorrhœa, but he has noticed no improvement in his gleet.

To take the copaiba and turpentine mixture three times a day, and inject with sulph. of zinc.

20th. No improvement.

R. Hyd. c. cret. gr. iij. Pulv. rhei. gr. v. M. om. mane. sum.

A blister to the perineum.

21st. The blister has risen freely.

Acid nit. dil. ♏xv.; dec. uva. ursi ℥iss. M. ter die sum.

24th. Better. Continue the mixture and powders.

28th. Still some discharge.

Tinct. canth. ♏xii.; dec. pareira brav., ℥i. M. ter die sum.

30th. Continue.

April 4th. Continue.

11th. He is still pale and weak; there is now scarcely any progress made.

Rep. pulv. Mist. ferri. c. ℥i. ter die.

A piece of blue ointment the size of a nut to be rubbed into the perineum every night.

13th. Still the same.

Go on with the medicines, and take two pills of turpentine and strychnia every night.

15th. Great improvement. Continue.

On the 20th, as some discharge still seemed to linger about him, I ordered another blister to the perineum. This was quite effectual. I saw him some weeks after, and found he had had no discharge since.

There is, I believe, nothing novel in the idea of blistering the perineum for gleet, and I have merely added this case for the sake of distinguishing this form of gleet, both in diagnosis and treatment. Want of space, rather than want of material, compels me to stop here; but I cannot lay down my pen without expressing a hope that the subject will not be lost sight of.—*Med. Times, Sept.* 20, 1851, *p.* 303.

MIDWIFERY,

AND THE DISEASES OF WOMEN.

139.—CASES OF INVERSION OF THE UTERUS.

By Dr. Samuel Merriman, London.

[Dr. Merriman has described the six following cases as instances of recent inversion; and thus records his opinion as to the cause. He says:]

It has been generally supposed that this calamitous accident is caused by the rashness or hasty intermeddling of the midwife with the after-birth, and, no doubt, it has often been caused by such mismanagement; but evidence is to be found which warrants the belief, that some affection or peculiarity of the uterine system itself contributes its share to the occurrence. In the six cases about to be recorded, only one was in the practice of a midwife; the other five instances were, from the beginning, treated by practitioners of unquestionable experience, watchfulness, and caution, yet the life of each patient was suddenly placed in great jeopardy and hazard. These cases I now present, the two last indicating a condition of the uterus which I do not recollect to have heard of or seen described, as connected with inversion, but I was once called to a case of ruptured uterus, in which a very similar kind of soft, flabby, pulpy texture existed, and the rupture appeared to have taken place during a pain of unusually low power.

Case 1. Mrs. E. was delivered of her first child in January, 1802, after a favourable labour by a midwife of much practice. Some little time after the child was born the midwife gently, as she asserted, tightened the navel string to remove the placenta, when a very violent pain came on, and the uterus was completely inverted with the placenta attached. On this my friend, the late Dr. Seares, was sent for, who desired that my assistance should likewise be obtained, and I arrived in less than half an hour after the accident had happened. We found that the body of the uterus, with the placenta adhering, was lying without the os externum; blood was flowing profusely from the uterus, especially from those parts whence the placenta was detached; and the woman was in such an exhausted state as made us doubt whether she would survive till the uterus could be replaced. As no time was to be lost, Dr. Seares carefully removed the partially adhering placenta, and replaced the uterus within the vagina, while I was laying bare my arm; I then introduced my hand, carrying the fundus uteri before it, till I had passed my arm quite to the elbow within the vagina; at this moment I found the

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fundus uteri spring* from the back of my hand, and the os uteri begin to contract. I therefore cautiously withdrew my hand, and soon had the satisfaction of finding that the hemorrhage had ceased. Mrs. E. was in a state of syncope during the whole operation, but on our giving her wine and other cordials she revived, and afterwards recovered perfectly. She has since borne children, and never experienced any inconvenience from this alarming and dangerous accident, unless an attack of hemorrhage during parturition, five years afterwards, when in labour of her third or fourth child, can be attributed to this occurrence.

Case 2.—Nov. 16, 1815. I was requested to visit the patient of a surgeon, who had been extensively engaged in midwifery practice. On my arrival, Mr. —— stated that he had been called the day preceding to his patient, in her second labour, which was favourable and not of long continuance. After the birth of the child he waited for pains to expel the placenta, but as no uterine action came on, he at length deemed it necessary to remove it by manual assistance. He told me, that, instead of endeavouring to loosen the placenta by drawing at the funis, he judged it to be a safer course to assist the delivery of the after-birth by introducing his hand into the uterus, and he did so in this case; unfortunately, the adhesion being firmer than he had expected, he had the mortification and dismay of finding, that, as he withdrew his hand, he had inverted the uterus and grievously imperilled the life of his patient. With as little delay as possible he separated the adhering portion of the placenta, and placed the uterus within the pelvis, preparatory to employing means to re-invert it; but the poor lady became so faint and exhausted, that it was considered necessary to defer this part of the operation till, by cordials and restoratives, she could be somewhat recovered. Whether it would have been practicable to re-invert the organ under this state of exhaustion, or whether it would even have been justifiable under such circumstances to make the attempt, it is now useless to inquire. But it cannot be too urgently impressed upon the mind, that one of two consequences must follow, unless the complete re-inversion of the uterus is soon effected,—either the profuse hemorrhage will destroy life, or the hemorrhage will be stayed by the contraction of the uterus in its misplaced condition; and this contraction, which prevents the further loss of blood, will also render impossible the re-inversion of the womb. This unhappy event occurred here. An attempt to reduce the inversion was made that same evening, but it was ineffectual. It was then hoped that, if good quiet sleep could be procured, the contraction of the uterus would be less firm in the morning. A dose of laudanum was therefore given to procure quiet sleep and composure. Early the next morning more steady and determined efforts were made, but all in vain, the uterus was too compact to be indented.

About the middle of this day my assistance was sought for, nearly twenty hours after the occurrence of the accident, and I likewise endeavoured to mould the parts, and to press the fundus upwards, but all in

* The late Dr. Squire, of Ely-place, thus describes the same sort of "spring." "By keeping a steady, firm pressure at the fundus, the uterus passed gradually before my hand, but when getting just above the arch of the pubis, it shot up suddenly with a kind of spring."

vain; I could not make the slightest impression on the solid substance. Finally, we were compelled to draw consolation from the reflection,—the only consolation that remained,—that, although this insurmountable calamity had deprived a young and amiable woman of the most distinguishing privilege of her sex, yet her life had not fallen a sacrifice.

Several years after this event, and after Mr. ——'s death, I heard from the medical attendant of this lady that she was still living, and had suffered less from debility and the usual enervating consequences of such a misfortune, than most others who have been so sadly afflicted.

Case 3.—Oct. 31, 1821. Mrs. H——, of Clarges-street, a hard-working woman with several children, was delivered of a large child, after a labour of no great severity or duration, by a very cautious and experienced accoucheur. Soon after the birth of the child, a strong forcing pain came on, and she cried out that something very large had passed from her. Attention being immediately paid to this, it was discovered that the uterus, with the placenta closely adhering, was inverted and expelled without the os externum. In this emergency I was sent for, and, having satisfied myself that this was the poor woman's condition, I proposed to my friend that we should avail ourselves of this opportunity of ascertaining whether it would be advantageous to re-invert the uterus without first removing the placenta, and, as he concurred in my suggestion, we immediately proceeded to put the plan in practice.

We soon found that this was not so easy an operation as we had expected; all our endeavours were useless; we could by no means return the bulky mass within the os externum. Unwilling, therefore, to risk anything by delay, we peeled off the placenta, and then, without much difficulty, replaced the uterus in its natural position. In this case I did not discover that "spring" from the hand, on re-inverting the uterus, which I have mentioned in the first case, but I retained my hand within the womb till I found it duly contracting, when I withdrew it, and all did well.

Considerable, but not excessive hemorrhage attended this accident; the poor woman required brandy and other support on account of faintness, but recovered more speedily than, from her condition in life, and the want of many comforts, might have been expected.

Case 4.—March 4, 1822. I was sent for to see Mrs. G—, in Piccadilly, who had been delivered in this her first labour of a fine living child. The cause of my being desired to see the patient was, that on her medical attendant attempting to ascertain, in the usual space of time after the birth of the child, what was the state of the placenta, it appeared, on tightening the funis, to be so loose and low in the vagina, as to give assurance that it might be at once safely withdrawn. When, however, traction was made for this purpose, a mass, much more compact than the after-birth, was brought without the os externum. Mr. —— soon became convinced, on careful manipulation and consideration, that this was a portion of the uterus adhering to the placenta. The examination I made led to the same conclusion; it was, in fact, a partial inversion or intro-susception, not, however, produced as such intro-susceptions usually are, by a depression or sinking in of the fundus uteri, but a protrusion

caused by a spasmodic or cramped condition of the distended uterine parietes, or possibly from the entire suspension of uterine action.

The present case offered a more favourable opportunity than the last, for making the experiment of returning the entire mass, before effecting the separation of the placenta; but my experience on that occasion did not encourage me to recommend a second trial. We, therefore, first removed the placenta, and afterwards had little difficulty in carrying back the protuberant uterus, and replacing it safely in its pristine condition.

Much faintness and debility occurred in this case from rather profuse flooding, but the patient was supported by wine and other nutriment and cordials, and ultimately recovered perfectly.

Case 5.—Jan. 21, 1831. I received a message late in the evening, to make a visit three or four miles off, to the wife of a clergyman, who had been delivered, by a very able practitioner, of her first child, after a tedious and hard labour, followed unfortunately by an inversion of the uterus, with adhering placenta. The hemorrhage was profuse, the patient much exhausted and full of alarm; and her father, an old and much esteemed medical friend, who had been present all the time, overcome with apprehension and fatigue, was most anxious that I should be sent for. Meantime the accoucheur in attendance on the patient had with great circumspection and caution kept watch over the case, and had, as much as possible, soothed and tranquillised all parties. He had supplied cordials and nourishment, had removed the adhering placenta, had lessened the hemorrhage, and deposited the uterus within the vagina; everything, indeed, except the re-inverting of the organ, had been accomplished before my arrival. On examination of the patient, I found that the pulse had recovered some degree of firmness, and that the hemorrhage was not very profuse, but that the uterus, in a very soft pulpy state, had escaped without the os externum.

At the desire of the patient's father, and with her medical attendant's approbation, I proceeded with as little delay as possible to re-invert the uterus, and found this a most difficult operation, from a cause altogether different from what I had ever before experienced, viz., an extreme tenuity of the substance of the uterus, and the size of the inverted bag. I was obliged to mould the uterus with my fingers, to grasp it in my hands, and to press it in various ways, before I could effect the reduction. At one time I feared that I must give up the attempt in despair, but at last I had the happiness to effect the entire re-inversion. Once or twice, from the very flabby attenuated condition of the uterine parietes, it seemed as if my fingers must unavoidably perforate its substance, as it did not possess the slightest degree of firmness or contractility.

This lady remained weak and delicate for a long time, but ultimately got quite well. In about two years she had another child, and suffered greatly from profuse hemorrhage, with adhering placenta, but there was no inversion; and from this likewise she perfectly recovered. However, the peculiarity in the condition of the uterus proved ultimately fatal; for the lady's husband having been presented to a living in the country, she went thither to reside, and I learned from my worthy old friend, her father, that her labour in the country was similar to her first, with

hemorrhage and inversion, which proved speedily fatal: but with the full particulars of the case I was never acquainted.

Case 6.—April 13, 1838. In the afternoon of this day I was called to a case bearing many points of similitude to the last. It was the patient's second labour, and a healthy child had been born by the natural efforts, shortly after which the attending practitioner's attention was directed to her, by her crying out that something was passing away from her. This proved, on examination, to be the uterus inverted, with profuse hemorrhage, and with the placenta still adherent: without delay the placenta was peeled off, and the uterus immediately re-inverted. In this condition, however, it did not remain, but was speedily expelled again, in a state of inversion. It was just about this time that I arrived, and found the uterus in a state of great tenuity and flabbiness of texture. It was again re-inverted, and restored to its proper position, and was with some difficulty retained *in situ*, perhaps somewhat contracted; but the patient w s so much spent and exhausted, that, notwithstanding every possible appliance we could make, or means we could devise, she survived only about an hour. A firmer and more contractile disposition of the uterus in this instance, would probably have preserved a most valuable life.—*Med. Times, July* 12, 1851, *p.* 36.

[Dr. Merriman makes a few remarks upon the treatment of this condition of the uterus, because, in the third edition of his 'Synopsis of the Various Kinds of Difficult Parturition,' he spoke approvingly of a mode of treatment which in the fourth he condemned, as in a recent case it had altogether failed. He says:]

I take the liberty of quoting the words used by Dr. E. Smith, in commenting on "A Fatal Case of Inversion of the Uterus with attached Placenta," at a meeting of the Medical Society of London, May 17, 1851: "Dr. Denman and Dr. Burns advise that the uterus, with the attached placenta, be returned. Dr. Merriman also gives the like advice, but he mentions an instance in which he first detached the placenta, and the patient did well. It is highly important that some definite rule should be laid down by the profession; for if it be judged best to detach the placenta, it will be injurious to lose time in endeavouring to return it; or if it be deemed proper to return the mass, it cannot be right to run the risk of alarming hemorrhage by first detaching the placenta."

In this conclusion I quite agree, as far as it is possible to be definite in such a case, consistently with the privilege which must be conceded to every competent practitioner, of being influenced in the treatment of each case by the peculiarities which such case presents; and I hope that the words in the above extract, "Dr. Merriman gives the like advice," fall under this category.

The advice or counsel which my volume gives, is to be found in the following extract:—"The presence of an inverted uterus being ascertained, it becomes the accoucheur to use the most prompt and decisive means of relieving his patient, and this can only be done by immediately re-inverting the uterus. To effect this, he must first return the uterus within the vagina, then, having his arm bare and well smeared with lard, he must pass his hand through the os externum, and resting the

backs of his folded fingers against the fundus uteri, he must carry it forward till he finds his hand within the cavity of the uterus; and still pursuing his object, he must push his hand onwards till he is fully satisfied that he has completely re-inverted the uterus, and that the contraction of the os uteri will prevent any future mischief." p. 150. This is the sum and substance of my advised and deliberate recommendation; but in commenting upon this, and in deference to the expressed opinion of Dr. Denman, who had favoured me with many conversations on this and other points connected with midwifery, I was induced to add, inconsiderately I admit, these words, "I think I should not in future remove the attached placenta till after the uterus was restored to its right position."

It was not long before I had an opportunity of testing this method of procedure. My volume was published in 1820, and in 1821 I was sent for by a friend to the case above alluded to, where I found the uterus inverted with the placenta adhering. I did not hesitate in proposing the method suggested, and my friend and myself made attempts, as long as we felt justified, to re-invert the uterus without separating the placenta, but all in vain. We were, therefore, under the necessity of detaching the placenta, and the reduction of the inversion was speedily effected, and the patient perfectly recovered.

To my friends, to the gentlemen who were attending my lectures in Medical Societies, and wherever I was able, this case of failure was made known; and when a fourth edition of my 'Synopsis' was required, in 1826, the following passage was inserted at p. 158, viz., "In the last edition of this work, the following was the opinion which I gave upon this subject, viz., 'In a case of this kind, which occurred in my practice, the placenta was removed without prejudice; but I think I should not in future remove the attached placenta till the uterus was restored to its right position.' Subsequently, however, to my last edition, I was called to a woman with an inverted uterus to which the placenta adhered. I tried to effect the reduction without removing the placenta, but could by no possibility accomplish it till I had first separated the placenta. This being effected, I succeeded to my entire satisfaction in re-inverting the uterus, and the woman has since had two children born without accident or inconvenience."—*Med. Times, June* 21, 1851, *p.* 681.

[The following is an interesting case of inversion of the uterus, communicated by R. W. Nelson, Esq., M.R.C.S.E., of Sydney, New South Wales:]

L. M. W., æt. 22, of a stout, robust constitution, was taken in labour at two o'clock a.m., on Saturday, April 5th, 1851, of her first child. She was attended by a midwife; presentation natural, with a large roomy pelvis, parturition proceeded favourably until half past ten a.m., when, with one violent expulsive effort, the child was born, bringing with it the placenta and the uterus inverted. I saw the case in about half an hour afterwards, when I endeavoured to return the uterus, but could not. I then separated the placenta, and again endeavoured, but it was useless. The pain caused by my efforts was very great, and the patient was rapidly sinking. She died in an hour after delivery; the funis was not more than nine or ten inches long; the infant was small, but not

unusually so, and alive. The patient complained of great pain above each hip. She appeared to sink from the shock, for there was no hemorrhage.

[At a meeting of the Pathological Society of London, DR. WEST exhibited a specimen of]

Chronic Inversion of the Uterus, which caused death, in consequence of frequently recurring hemorrhage, twenty-nine months after its occurrence.

The patient, aged 29, first came under Dr. West's notice in January, 1850, fourteen months after her fourth labour.

She had been married seven years; all her labours had been natural and quick; but her last was attended, immediately after the extraction of the placenta, with a very violent hemorrhage, which occasioned syncope, and which was accompanied with the appearance of a tumour beyond the external parts. This was attributed to a forcible attempt to remove the placenta made immediately after the expulsion of the child.

The tumour was replaced in the vagina by the medical attendant, and she experienced no further inconvenience until a week after, when the tumour again projected externally, and was once more replaced; since which it never projected outwardly, though it was often just within the external parts.

She suckled her child for thirteen months: for the first ten months she had no ailment, but at the eleventh month menstruation came on very profusely: it recurred still more profusely at the 12th, and even more at the 13th period.

She was in the hospital at her 14th period: its abundance was checked by the matico; but, at her 15th period, and on one or two subsequent occasions, it became necessary to plug the vagina.

The uterus, at the time of her admission, was found entirely inverted, with the exception of the os, which, however, did not constrict the organ at all, but allowed of the easy introduction of the finger between it and the uterine wall. Attempts to revert the uterus, one hand being introduced entirely into the vagina, while firm pressure was made with the other on the pubes, were made both by Mr. Stanley and Dr. West, without success.

The uterus, when touched, always showed a very low degree of sensibility. She refused to submit to the removal of her uterus by ligature, and, for a time, she decidedly gained ground; matico, both internally and as a lotion, checking the menstruation and restraining the hemorrhage very greatly; while, under the use of preparations of iron, she gained strength in the intervals. In September, 1850, this improvement ceased; and, though there was no great increase of hemorrhage at the menstrual periods, yet there was an almost constant oozing of blood, in the intervals of which she was greatly exhausted, and the return of each menstruation left her weaker than before. She died on April 19th, 1851, utterly anæmic; the discharge from her vagina having for some weeks been almost entirely serous. A considerable quantity of transparent serum was found in the abdominal cavity, but all the organs were drained of blood.

The uterus was completely inverted; the peritoneum, just at the point of inversion of the uterus, had lost its transparency, and was thickened and uneven; but there were no other traces of inflammation or its results. The insertions of the uterine appendages were drawn down into the cul-de-sac formed by the inverted uterus, the contraction of which had been so considerable that it would not have been possible to introduce into it any body larger than a quill.

The openings of the Fallopian tubes into the uterus could not be discovered on its inverted surface. The epithelium, as ascertained by Dr. Kirkes, was cylindriform, but destitute of ciliæ. The cylinders apparently atrophied. The tissue of the uterus was unusually dense, but not otherwise altered.—*Med. Gazette, June* 6, 1851, *p.* 1005.

140.—*On Fissuring and Laceration of the Structures of the Perineum and Cervix Uteri in Natural Labour.*—As the result of a long series of observations, Dr. Simpson has drawn the following conclusions:—

I. Fissuring and laceration of the cervix uteri and perineum are not, as is generally conceived, rare lesions during labour; on the contrary, they are very common occurrences; especially in primiparous labours.

II. These lesions are not, as has been often alleged, necessarily the result of mismanagement, but they occur constantly in practice, despite every modification of management; and in cases also in which no kind of management has been adopted.

III. Evidence of the great frequency of laceration of the anterior structures of the perineum is furnished by,—1. Almost every careful autopsy of women after delivery, whether assisted or not assisted during their labour; 2. By the contracted or shortened state in which the perineum is almost always found, when vaginal examinations are made for uterine disease in women who have borne a family; and, 3. By the fissuring or laceration itself being usually traceable (under careful tactile examination), particularly in first labours, when that examination is instituted in the interval of pain, immediately before the passage of the child's head, or after its birth.

IV. Lacerations of the perineum may be often felt beginning in the form of slight roughish rents or fissures upon the mucous surface of the perineum, and these may extend either backwards or forwards; and if they extends forwards, they at last run over the edge of the perineum, and along its cutaneous surface; the mucous and cutaneous structures of the perineum being thus sometimes lacerated, while its middle, cellular, and fascial tissues are comparatively entire, or at least not so deeply and extensively injured.

V. The proper management and support of the perineum no doubt modifies and diminishes this form of perineal lesion; but it fails far more frequently than is generally supposed in entirely preventing it.

VI. The evidence of the frequency of fissuring of the os and of the lower or vaginal portion of the cervix uteri is the same in character, and consists principally—1. In the frequency with which slight laceration of the edges of the os, and of the mucous and middle coat of the cervix, is

detected in autopsies after natural labours, and particularly with first children; and, 2. In the permanent marks of its previous occurrence, as exhibited in those cicatrices and irregularities of the cervix uteri, which anatomists have long empirically, but correctly, laid down as proofs that they, in whose bodies they are found, have been previously mothers.

VII. Fissures and lacerations of the vaginal portion of the cervix uteri not unfrequently occur to a very considerable extent, in cases in which the tissues of the cervix have been rendered rigid by previous inflammation, by carcinoma, or by other morbid causes; and, in such cases, this fissuring or laceration, if limited to the lower or vaginal portion of the cervix, seems to be accompanied with little or no danger.—*Monthly Journal of Med. Science.—London Journal of Medicine, September*, 1851, *p.* 847.

141.—ON OVARIAN IRRITATION.

By Dr. Fleetwood Churchill, M.R.I.A., Hon. Fellow of the College of Physicians of Ireland, &c.

[The chief characteristic symptom of ovarian irritation is an uneasiness, or even pain, sometimes severe, in one or both—frequently the left—iliac or inguinal regions. It may be dull and constant, or it may be acute and occurring in paroxysms, aggravated by standing, and generally by walking. There is also, generally, a sensation of fulness about the iliac region, and always considerable tenderness. The irritation may extend to the bladder, exciting a desire to evacuate its contents frequently, causing great pain in doing so. Hysterical paroxysms are by no means unfrequent in subacute ovaritis. Dr. Tilt remarks that the ovaries are more or less painful on pressure, and that they are from twice to four times their original size. Dr. Churchill considers this as a proof of the affection under consideration, not being the same as that described by Dr. Tilt.]

These are the principal local and direct symptoms I have observed; they vary much in degree, and are in some cases so intense as to resemble an attack of acute ovaritis. They differ also more or less according to the circumstances in which the attack occurs; and in order to elucidate this point, I shall briefly enumerate the circumstances.

1. In patients who suffer occasionally from amenorrhœa, it is not uncommon to find ovarian irritation at these periods, and not altogether confined to them. Whether the ovarian irritation be the cause of the suppression of the catamenia, or merely a symptom, is a question not easily decided. In many cases I think it is probably the primary affection, but in some others it appears to be the result of the amenorrhœa. The suffering is often considerable, and may be prolonged until the next catamenial evacuation: if that be full and free, the pain and tenderness generally disappear.

2. Upon the sudden suppression of menstruation, it is not unusual for the ovaries to be almost instantly affected, either by the form of dis-

ease I have described, or by an acute inflammatory attack, which is more rare.

3. In dysmenorrhœa there is more or less ovarian irritation. If we examine the patient minutely as to the seat of the pain during the period, we shall find that it is principally in the region of one or both ovaries and often accompanied by tenderness on pressure. In the majority of these cases I am inclined to think that the ovaries are secondarily affected.

4. In menorrhagia, the ovaries may apparently preserve their integrity for a long time; but if the attacks be frequent, I have generally found that these organs, one or both, become affected, and that the irritation frequently continues long after the discharge has ceased.

5. I have repeatedly seen this ovarian irritation accompany congestion and erosion of the cervix uteri, but it most frequently comes on after the latter disease has persisted for some time, or after it is nearly or quite cured. The ovarian irritation, however, in these cases, very soon subsides.

6. I have already mentioned its occurrence in hysteria, both when the latter is dependent upon catamenial disburbance, and when the periodical discharge is quite correct.

7. In some few cases I have recognised ovarian irritation in cases where the uterine and ovarian monthly functions were apparently accurately performed, but the patients were of a highly nervous temperament, in delicate health, and without offspring.

These various classes include, I think, all or nearly all the examples of the disease which have come under my observation. In many cases it requires care to separate the ovarian symptoms from those caused by the concurrent disease, but in other instances this distinction is quite obvious. When uncomplicated, the disorder rarely gives rise to any general or constitutional symptoms. Many of the subjects of it are delicate and weak, and of course this attack keeps them so; but ordinarily the pulse is not quickened by it, and there is neither heat of skin nor thirst. The appetite is seldom good, but it is not worse than usual, and the bowels are generally irregular. I have examined the urinary secretion, and have repeatedly found it scanty, acid, and occasionally mixed with mucus.

As to the *pathology* of this affection there are several points of considerable interest. I think we can entertain no doubt that the ovaries, one or both, are the seat of the irritation; the peculiar and fixed locality of the pain, and its frequent connexion with the ovarian function of menstruation, all confirm this view. But the next question is more difficult to decide positively, viz., is the disorder an inflammatory affection of the ovaries, either acute or subacute? The disease described by Dr. Tilt certainly presents characteristics of inflammation, which I have never observed in the present disorder. The absence of tumefaction generally, and of a distinct tumour always, the negative results of an examination *per vaginam* and *per rectum*, the intermitting and paroxysmal character of the attack, the absence of all the ordinary results of inflammation (as abscess, accumulation of fluid, &c.), even in the severer cases, and the success of a certain line of treatment, are all, to my

mind, very strong arguments for the non-inflammatory nature of the disease. In most of these particulars, it differs from the subacute ovaritis of Dr. Tilt. I have certainly seen some cases in which the point seemed doubtful, and it is probable that the one form of disease may, under certain circumstances, merge in the other; but I cannot resist the conviction, that the affection I have described is essentially neuralgic, and not inflammatory.

Again, it may be asked, is this ovarian irritation the cause of the menstrual disorder or its effect, or merely a concomitant symptom? No one acquainted with the present state of ovarian physiology could deny that the integrity of the menstrual function must be largely influenced by the condition of the ovaries. If this ovarian irritation always preceded the catamenial period, I should be inclined to attribute to it the subsequent distress; and in many cases it appeared to me that I could so trace it as the chief cause. But in some cases, the ovarian irritation distinctly followed the menstrual disturbance or came on towards the termination of the monthly period; and lastly, in other cases, the irritation existed with no catamenial derangement at all. Without doubting, therefore, that ovarian irritation may disturb the menstrual functions in various ways, I cannot agree with those who think that it invariably does so, nor yet with those who are inclined to attribute all menstrual disorders to deviations from the normal condition of the ovaries.

I need not occupy time by enumerating many *causes* for its production; all those which act upon either the uterus or ovary and disturb their functions, may be considered as causes of ovarian irritation, and among these the most frequent, probably, is cold.

I believe that, in many cases, excess in sexual intercourse has given rise to it; and I am also inclined to think, that in a few cases I have known it originate from the entire deprivation of that stimulus. For some valuable remarks upon this subject I shall refer my readers to Dr. Tilt's excellent work, a review of which appeared in a late number of this journal: all that he says upon this point is, I think, equally applicable to ovaritis and ovarian irritation.

The circumstances under which the attack occurs, I mean its relation to the menstrual functions, the symptoms, and the peculiar locality of the pain, render the *diagnosis* tolerably easy in most cases. It may, certainly, be mistaken for intestinal irritation; but, in general, there are no other symptoms than the pain to justify such an opinion. The bowels, even if irregular, are free from irritability.

It will, however, require a little more trouble to render it certain that there is not acute ovaritis, which the tenderness might lead us to suspect. But this tenderness is *generally much greater than that resulting from inflammation;* it is a kind of a nervous tenderness which shrinks from the weight of a finger as much as from severe pressure. Moreover, in acute ovaritis, the organ is always swollen and enlarged, and it can generally be felt distinctly to be so by an internal examination.

In phlegmonous inflammation of the uterine appendages, or pelvic abscess, as it has been termed, the hard and painful tumefaction is quite plain at the brim of the pelvis, and, therefore, it cannot easily be confounded with the present disorder.

I shall not enter at any length into details of the *treatment* of this disease, inasmuch as I have only my own experience to which I can refer. The choice of remedies will be governed, to a certain extent, by the health, strength, and state of constitution of our patient. With strong, healthy women I have tried leeches to the ovarian region, with some benefit but not complete success, nor in all cases; from six to twelve may be applied at once, and repeated, if necessary, after an interval. Poultices after the leeching are of use; and indeed, when no leeches have been applied, I have seen much comfort and relief derived from repeated poulticing. With delicate women, and they are frequently the subjects of this disease, bleeding in any form has appeared to me rather injurious than beneficial.

I have tried the repeated application of small blisters with better results than leeching. The irritation of the surface certainly relieves the pain in many cases, and, if continued, may finally cure it; but I must confess I have seen it fail repeatedly.

Anodyne liniments and anodyne plasters occasionally seem to afford relief, but they are often of little or no use; I tried anodyne enemata several times with partial success.

In two or three cases I used the tincture of aconite, applied liberally to the iliac region, but I confess the result disappointed the expectations I had formed.

Having failed in affording any relief in two or three obstinate cases, I determined to try the effect of opium applied to the upper part of the vaginal surface I accordingly ordered some balls or pessaries to be made, somewhat in the mode of Dr. Simpson's medicated pessaries, each ball to contain two grains of opium, half a drachm of white wax, and a drachm and a half of lard. The whole, when mixed together, formed a ball about the size of a large marble, and I placed it at the upper end of the vagina by means of the speculum, leaving the patient in bed for the rest of the day. The success was quite beyond my expectation; the relief was very speedy, and in most instances complete. Even when the pain did return after a few days, a second application removed it. The tenderness disappeared with the pain, and no unpleasant consequences have resulted in any instance.

I have now tried this remedy in a considerable number of cases, and with almost invariable success. I have rarely found it necessary to bleed or blister since I first adopted this plan; and I recommend it, with considerable confidence, to the profession. I may add that I have tried these pessaries in cases of dysmenorrhœa, applying one the day before the catamenia were expected, with decided benefit.

It is hardly necessary to say that, in this disease, the bowels should be regulated, and gently freed by medicine when necessary. If the appetite is bad, vegetable bitters may be given, and I have generally found it useful to combine some alkali with them.—*Dublin Journal of Med. Science, Aug.*, 1851, *p.* 82.

142.—ANEMIA AS A CAUSE OF DISEASE IN THE FEMALE, AND PARTICULARLY OF PUERPERAL MANIA.

By Dr. F. W. Mackenzie, Physician to the Paddington Free Dispensary for the Diseases of Women and Children, &c.

It is unquestionably a fact, that anemia, in various degrees, prevails very generally amongst females, and that its existence is often unrecognised both by the patient and her friends; whilst, at the same time, its influence is very considerable in modifying and predisposing to various secondary diseases. The great susceptibility of the nervous system in females generally, both consequent upon, and independently of, impregnation and its results, is well known; but its connexion with certain conditions of the blood does not appear to have been as fully appreciated. It has been observed, for instance, that the nervous system of the female in health is far more irritable and susceptible to impression than that of the male; but it is also the case, that the healthy constitution of the blood of the former differs materially from that of the latter, and that, with a slight exception in favour of albumen, the blood of the female contains a smaller proportion of nutritive and vivifying elements than that of the male.*

The avocations of females in many instances, their education and modes of life, more especially of those of the upper classes of society, doubtless tend still further to diminish this proportion, and to produce a correspondingly more irritable condition of the nervous system, as well as a greater susceptibility to the operation of disturbing causes. Anemia, however, when slowly induced, and existing even in an extreme degree, is not incompatible with a comparatively healthy performance of the bodily functions, and thus may have been of long continuance without attracting any particular notice; but persons so suffering readily succumb to morbid influences: they are unequal to much fatigue, possess, for the most part, but little energy, and are often incapable of performing their allotted and ordinary duties. Should impregnation take place under these circumstances, the blood becomes still further impoverished, and the constitutional powers heavily taxed in the performance of the functions necessary for the purpose of "forming, lodging, expelling, and feeding the offspring." If secondary disease has hitherto been averted, there is now a greater probability of its supervening, and hence, during utero-gestation, various functional disorders are liable to occur. The brain and nervous system in particular become unduly excitable, and, in some cases, incapable of withstanding the shock and the consequences

* I subjoin the following table from Dr. Carpenter's Physiology, embodying the general results of the analysis of Denis on this point.

	Male.		Female.	
	Maximum.	Minimum.	Maximum.	Minimum
Water	805	732	848	753
Albumen	63	48·5	68	50
Globules	186	110·5	167	71·4
Fibrin	4	2	3·1	2

of labour. Hence it is, that intense cerebral disturbance, consequent upon great nervous irritability, is so liable to occur under such circumstances, with or without the supervention of some casual exciting cause.

[Dr. Mackenzie has been led to conclude that there is an undoubted connexion between the existence of anemia antecedently to labour, and the occurrence of mania subsequently, and that this connexion is more than casual. Stout persons as well as spare are obnoxious to puerperal insanity, for a stout adipose subject is not necessarily a healthy one; as the blood may be in such, and constantly is, either impoverished or scanty.]

The existence of anemia cannot be determined by the conformation of the patient. It is rather to be sought for in the pallid complexion, the paleness of the inner surface of the lips, and of the palpebral conjunctivæ; in the frequent palpitation of the heart, the breathlessness on exertion, the abnormal murmurs heard over the heart and jugular veins, the feebleness of the pulse, and the general coldness of the feet and hands: with these symptoms, there is often languor and lassitude, and general feebleness of the bodily functions. These are the surest indications of the presence of anemia; and when they are sufficiently attended to, it will often be found to exist where otherwise it might never have been suspected.

That this condition of the blood should favour the occurrence of puerperal insanity, would appear to be highly probable, from a variety of circumstances. In the first place, it is obvious that for the healthy performance of the functions of the brain, as of other organs, it is necessary that there should be a due supply of healthy arterial blood; and that this supply cannot be greatly diminished in quantity, or deteriorated in quality, without producing disorder, or a great susceptibility to it. "That the brain is an organ receiving a very great supply of blood; that its vessels are large and numerous; that an increased determination of blood to it, or, on the contrary, a diminution of the quantity conveyed to it, must have an effect upon the cerebral functions; and that the perfect or imperfect state of the intellectual and nervous powers is intimately dependent upon the condition of the circulation within the head, are facts of which no doubt can be entertained. Hence, amongst the frequent consequences of anemia, may be mentioned an extremely irritable condition of the brain and nervous system. In some cases, this amounts to actual disorder; in others, to a susceptibility, which only requires some casual circumstance to develope into positive disease. Thus, in puerperal patients, when greatly anemiated, mania may occur as the result of the mere shock and consequences of labour. But when the blood is less impoverished, additional disturbing causes may be necessary; and those which would produce it in a puerperal patient, are similar to those which would occasion it in the non-puerperal state. Of these, mental agitation, shock, or emotion, loss of blood, and irritations of various organs reflected upon the sensorium, particularly of the stomach, liver, and intestines, are the most potential; and the cerebral disorder induced by these in anemiated non-puerperal persons, is precisely similar to the mania of the puerperal state.

In the second place, the general symptoms attending puerperal mania, are identical with those which are met with in anemia. The brain and nervous system, it is true, are in a state of extreme excitement; but the condition of the patient generally is one of weakness and exhaustion. The pulse is small and quick; the extremities cold; and the excitement has been truly characterised as "action without power." Moreover, in all the cases which I have seen, loud continous murmurs were heard over the cervical veins, as well as those cardiac sounds, which are indicative of an attenuated state of the blood.

In the third place, the progress of the disease does not materially differ from various cerebral affections, which are occasionally met with in anemiated patients; and whilst in each the tendency under favourable circumstances is to recovery, in either the reverse may happen from very similar causes. Thus, in either, congestion of the brain may occur from feebleness or irregularity of the circulation; and, consequent upon this, effusion may take place, leading to a fatal termination. When, again, the malady is protracted, various organic changes may be induced in the brain and its membranes; and these may give rise to permanent insanity, epilepsy, or paralysis.

Treatment.—The treatment generally proper for anemia will be found, upon the whole, to be most appropriate for puerperal insanity. Special indications will require to be fulfilled by special means; and slight forms of the disease will often yield to the unassisted efforts of nature. But when the attack is severe, and resists the natural efforts, as well as specific treatment, it will generally be found that this obstinacy is connected with an aggravated form of anemia, and that in proportion as the condition of the blood is improved, will the cerebral disorder disappear.

If the foregoing observations should prove to be correct, and if it should be established as a fact that anemiated persons are especially predisposed to puerperal insanity, it will follow that the treatment should not only be curative, but preventive. The practitioner, aware of the cases in which there exists a predisposition to the malady, will be forewarned, and prepared to take precautions against its accession. During pregnancy, he will endeavour to improve the condition of the blood and the tone of the nervous system, by attention to diet and regimen, and such auxiliary treatment as may be indicated in particular cases. During labour he will especially endeavour to diminish the shock upon the nervous system, and to prevent or lessen excessive or immoderate hemorrhage; whilst, during the puerperal period, he will rigidly guard his patient against the influence of those occasional causes, which are known to determine the attack, such as mental alarm, agitation, or emotion, gastric, hepatic, or intestinal irritation, or any organic irritation which is capable of being reflected upon the brain. In short, the indications are twofold; on the one hand, to adopt such measures during pregnancy as are calculated to improve the blood; on the other, to guard the patient, both during and subsequently to labour, against such influences, mental and physical, as have been known to occasion the attack.

The first indication comprises the treatment of anemia in all its

several forms,—a subject which is far too comprehensive and extensive for discussion in the present paper. Its relations, moreover, to uterine and puerperal diseases generally are so important, that I propose to consider it in a separate communication. It should comprehend attention to external circumstances,—habits and modes of life; to the condition of the digestive organs, as well as that of the nervous system generally; to various remote causes of a depressing character, mental and corporeal; and thus should comprise measures both moral and physical, dietetic and medicinal.

The second indication, so far as prevention is concerned, is to protect the patient, both during and subsequently to labour, against the influence of the exciting causes of the malady. These are, for the most part, well ascertained, and comprehend two classes. The first class comprises those which directly operate on the mind; the second, such irritative disorders of the body, or of particular organs, as are capable of affecting the brain unfavourably, whether by sympathy or otherwise. All painful states of mind should, if possible, be prevented: distress, anxiety, grief, or any emotion, have, in some instances, immediately given rise to an attack of mania; as also have fright, agitation, sudden shock, or alarm. These also should therefore be rigidly guarded against. Of bodily derangements, it may be said, that any "uncommon irritation spreading to the brain," may be the exciting cause; but certain organs sympathise more directly with it than others, and the disorder of these is especially to be attended to. Such irritative disorders may be enumerated in the following order, as regards their frequency, in the causation of the disease: gastric, hepatic, or intestinal, either singly or combined; uterine and mammary.

The curative treatment of puerperal insanity, should it unfortunately have occurred, is one of extreme difficulty;—not less so from the nature of the indications to be fulfilled, than from the reluctance of the patient to acquiesce in the necessary measures of treatment. It should comprise attention to at least the following four points:

First. The removal of any exciting causes which may exist, and of any bodily derangement which may have been instrumental in the causation of the disease.

Secondly. The subduction of cerebral excitement, and the restoration of tranquillity to the nervous system generally.

Thirdly. Guarding against the occurrence of congestion, effusion, or other disease of the brain.

Fourthly. Supporting the constitutional powers, restoring the general health, and improving the condition of the blood.

1. The first indication points to the removal of such exciting causes as may have been concerned in the production of the disease. It has been remarked, that these are referrible to two heads: the one operating directly upon the mind; the other consisting, for the most part, of various kinds of irritation in remote parts of the body. When mere emotion has been the exciting cause, and no physical disturbance can be discovered, it is probable that a full opiate, together with extreme quietude, and the constant application of ice to the head, may at once overcome the cerebral excitement, and avert any further bad consequen-

ces. It must, however, be remembered that opium is contraindicated, whenever gastro-intestinal irritation exists as a consequence of the presence of crude, unhealthy, or indigested matters in the stomach or intestines. When, therefore, the tongue is furred, the breath unpleasant, the alvine discharges scanty and unhealthy, as also when the abdomen is tumid and uneasy,—evacuant medicines should precede its administration. If gastric disorder exists in a marked manner, there can be no question as to the advantage and safety of giving an emetic, for the purpose of effecting the direct removal of gastric impurities; and ipecacuanha, with squills with or without the tartrate of antimony, according to the strength or debility of the patient, answers well for this purpose. Full vomiting will generally follow its exhibition; and if solid matters, such as undigested food, be not thrown up, there will often be an evacuation of vitiated unhealthy secretions, in large quantity, which will be productive of much relief. Having premised this step, the next should be to act upon the liver and bowels, not only for the purpose of carrying off irritating matters, but of promoting secretion from them, as well as elimination. Calomel and jalap combined, are extremely efficacious for the purpose, and should be given in full doses; but when they fail, or are otherwise objectionable, I believe that croton-oil, with the watery extract of aloes, and a little Castile soap, will be found of signal service. I have certainly found this to answer well in these cases. It also should be given in decided doses, and repeated every four or six hours, until the necessary evacuations have been obtained. These will generally consist of a number of fœtid and unhealthy stools; and, when they have been voided, the symptoms will often manifestly improve, whilst the further management of the case will be considerably simplified.

2. The second indication refers to the necessity of allaying the inordinate cerebral excitement, and of restoring tranquillity to the nervous system generally. These objects will be best attained, the former by the exhibition of tartar emetic in small and frequently repeated doses; the latter by opium, morphia, henbane, or some other narcotic. The tartrate of antimony may be given to the extent of one-sixth or one-eighth of a grain every half-hour or hour, until the desired effect is produced; and it is sometimes advantageously combined with small doses of the sulphate of magnesia. Any disposition to vomiting may be obviated by the addition of the hydrocyanic acid; and some have found it useful to add a few drops of the tincture, or sedative solution of opium, to each dose.

The administration of opium, in these cases, requires much caution, and careful consideration of the circumstances. Opium, I would observe, has a twofold action upon the economy; and each is distinct and dissimilar. Upon the functions of animal life it operates as a sedative; upon those of organic life, as a stimulant; and thus, whilst on the one hand, it lowers inordinate action of the brain and spinal cord, it tends, on the other, to exalt the activity of the vascular and organic functions. Hence, its efficacy is greatest in those cases in which the sanguiferous system is most depleted, and the vital and organic functions are most depressed; and, conversely, its employment is least proper where there is a tendency to vascular fulness, whether general or local, and more

especially of the encephalon. In proportion then as the pulse is rapid and weak; in proportion as organic debility prevails, and there is an absence of cerebral congestion or determination,—is its use indicated in this disease; and, whatever may be the intensity of the mental excitement, in such cases it may be given fearlessly and freely. When, however, these conditions do not exist unequivocally, as will happen in the majority of instances, it must be had recourse to more guardedly, and its action modified according to the particular circumstances of each. "Opiates have been given with two intentions," says Denman; "some have merely proposed to soothe and moderate the violence of the disturbance by the frequent repetition of small or moderate doses; others have aimed, by the more liberal use of opium, often repeated, to suppress the irritability altogether. As far as I can judge, the former method is far preferable to the latter; and I think there can be no doubt but that opiates in larger doses, instead of diminishing, add, in no small degree, to the irritability which before existed." It is certainly impossible for any one to lay down a rule, applicable to all cases, for the administration of opium, or any other narcotic, in this disease. I have found full doses at bedtime, with smaller during the day, to answer well in some instances; and it is sometimes useful to alternate the use of one narcotic with that of another. Tranquillity and sleep are the great desiderata to be attained; and different medicines, and different modes of exhibiting them, will be required in order to attain this end in different cases. It is, however, most necessary to watch the effect of such remedies, and not to push them beyond certain limits, when their efficacy is questionable, merely in deference to popular custom or opinion.

As auxiliary to these measures, the pediluvium, sinapisms to the calves of the leg, and revulsives to the extremities, may often be had recourse to with advantage. The use of the pediluvium was especially recommended by Dr. Robert Whytt; and he gives, in illustration of its utility, the following case, which would appear to have been one of puerperal insanity. "A lady, aged about twenty, on the fourth day after being delivered of her first child, began to be feverish, and slept none. After this she became very delirious, talked constantly, had sometimes tremors, and was so restless, that for two days she had not lain one minute in the same posture, and was with difficulty kept in bed by two or three nurses. On the tenth day after her delivery, when I first saw her, the symptoms now mentioned were all increased, only she spoke none, and seemed to understand nothing that was said to her; her pulse which was but of moderate strength, beat above one hundred and fifty times in a minute, —nay, once, when she was more agitated than usual, it rose to one hundred and eighty strokes in that time, and became withal very small. As she had been blooded, and blistered, and used several other remedies, *without advantage,* I ordered her feet and legs to be put immediately into the warm *pediluvium,* which was done by making her sit up on the bedside. At first it required two people to keep her feet in the water; but in less than a quarter of an hour she grew calmer, and made little motion, either with her legs or any other part of her body. After using the pediluvium for half an hour, she was put to bed, but soon began to grow as restless as formerly; upon which account warm fomentations

were applied to her legs and feet, and renewed, from time to time, for near two hours, but without any benefit. I therefore thought it best to renew the pediluvium, which was used, at this time, for a full hour. It soon made her sit quiet; and, after she was put to bed, although she did not sleep, yet she lay several hours without tossing as usual, and her pulse was reduced to 136. As often as she began to be any ways restless, the pediluvium was renewed. After using it the fourth time, she got several short sleeps, was less delirious, and her pulse only made 120 strokes in a minute. From this time (viz., the eleventh day after her delivery), the pediluvium which was never repeated above twice in twenty-four hours, produced her longer sleeps, and lessened all her bad symptoms; so that, in two days more, she was quite free of the delirium, and her pulse did not exceed ninety in the minute."

3. The next indication to be attended to, is to guard against the occurrence of congestion, effusion, or other disease of the brain. Such consequences might frequently be anticipated from the extreme cerebral disturbance going on; but under proper treatment, they are fortunately rare. Nevertheless, the possibility of their occurring must not be lost sight of; and every precaution should be taken to avert them. The state of the circulation in these cases generally forbids the employment of active measures: general blood-letting is, for the most part, inadmissible, and hence abstraction of blood should be limited to the application of a few leeches to the temples, or behind the ears, when circumstances render local depletion necessary; but the constant application of ice to the head, the free use of purgatives, a careful diet, and tartar emetic in contra-stimulating doses, is safer practice, and will generally obviate all danger on this score.

4. The last indication points to the necessity of sustaining the patient, restoring her general health, and improving the condition of the blood. These are matters of the utmost importance; and, upon their due fulfilment will her recovery mainly depend. The means to be employed for these objects comprise all those measures of diet and regimen which appertain to the treatment of anæmia. The patient should be placed in a large, cool, and well-ventilated apartment; her diet should be carefully attended to, and this, in the early stages of the disease, should consist of light, unstimulating food, administered regularly and frequently, but in small quantities at a time. While there is much heat of skin, a quick pulse, and great excitement, milk, gruel, arrow-root, and sago, or other farinaceous articles, form the best diet. As the excitement and febrile disturbance subside, a little animal food, or fish, may be added; and, if the extremities should become cold, and the pulse very feeble, wine must be given in addition, and this, sometimes largely. In severe cases, it will be necessary to check the drain upon the system occasioned by lactation; and for this purpose evaporating lotions should be applied to the mammæ, whilst the bowels are kept open by saline aperients. In conjunction with these measures, the patient must be kept perfectly tranquil. All interviews with friends and relatives had better be prevented; conversation should be prohibited; and a regular nurse, accustomed to the care and management of the insane, should be in constant attendance. It is unnecessary to add, that so long as the

patient is under the influence of any mental delusion, she must be strictly watched, and everything kept out of her reach, with which she might do injury to herself or others.

Under this system of management, the progress of the case will generally be satisfactory; and, as the general health improves, the mental aberration will disappear. Should it be otherwise, additional measures for the restoration of the health will be necessary. Change of air will prove serviceable, and recourse may be had to tonics in addition to the regimen laid down. Of these, it would be advisable to commence with the mildest,—such as the mineral acids, or some light bitter; and, afterwards to prescribe the more powerful,—such as quinine or some of the preparations of iron.

I conclude, then, by observing, that the relations which subsist between anæmia and puerperal insanity are often of a very intimate nature; and that too much care cannot be paid to the investigation of this point. I do not contend that all forms of puerperal mental disorder are dependant upon anæmia; for I believe that they may arise from other causes, and be connected with other states of the blood:—but I maintain that the asthenic forms of the disease are by far the most frequent, and that of these anæmia constitutes an important pathological element. I believe, moreover, that a careful consideration of this point will often enable us to anticipate and avert the attack, or, when it has occurred, suggest the best method of treatment.—*London Journal of Medicine, June*, 1851, *p.* 505.

143.—EVIDENCE OF PUERPERAL FEVER DEPENDING UPON THE CONTAGIOUS INOCULATION OF MORBID MATTER.

By Dr. F. H. Arneth, Vienna.

[The gentlemen forming the medical council of Vienna, on enquiring into the cause of the prevalence of puerperal fever there, were struck with the fact that the mortality was much greater in the wards where the medical students were taught, than in those set apart for the education of the midwives. Dr. Semmelweiss, who was appointed assistant to the Professor of Midwifery, in whose wards this fearful mortality took place, endeavoured to divine the cause of the more favourable state of a neighbouring clinic, but he found that there also no better ventilation existed, nor had any particular plan of treatment been resorted to.]

At length, however, he was struck with what was very likely the sole difference to be found in the management of the two clinics, namely, the pupils of the one being midwives, those of the other medical students. The latter were, almost without exception, in the daily practice of assisting at autopsies, of which eight or ten took place in our large hospital almost every day. The dissections were sometimes executed by the students, or they handled at least the pathological preparations, and examined them carefully. Moreover, the assistant used to lecture on the obstetrical operations. These were performed on dead bodies, and, of course, sometimes repeatedly. Now, after such investigations and such practice, it was not rare to see the students going immediately to

the wards of the lying-in hospital, and examining the pregnant and paturient women.

It is scarcely necessary to state, that the pupils of the other clinic, being midwives, did not take any share in the occupations just alluded to; nay, even the assistant of that clinic had comparatively seldom to deal with post-mortem examinations, as it was not a part of his duty to give instructions to the midwives in pathology or operative midwifery.

Having convinced himself that the great prevalence of the disease in his wards was caused by the inoculation of the female genitals, Dr. Semmelweiss began to entertain a hope of being able to diminish this frightful mortality.

Every one who has been engaged on post-mortem examinations must be aware of the very disagreeable smell, which it is impossible to get rid of, even by the most careful washing. Of course this smell which remains about the hands is more penetrating and more lasting the more dissections have been made at a time. The existence of any smell can only be dependent on a substance detained on the epidermis, and is still sensible so long as there remains the least atom of that substance. It is impossible not to recollect how actively the process of absorption, generally speaking, is carried on in the pregnant female.

The opinion of Dr. Semmelweiss on this important matter is as follows: *Any fluid matter in a state of putrefaction*—communicated by linen, by a catheter, by a sponge, by small particles of the placenta, even by the ambient atmosphere impregnated with the foul substances—*may produce puerperal fever.*

If these ideas are admitted, it appears very likely that washing the hands with some powerfully cleansing fluid must destroy the smell, and remove the morbific particles from the hand.

After having tried various substances, he was latterly in the habit of prescribing for that purpose solution of chloride of lime as the cheapest.

In the course of the month of May, 1847, it was arranged that no one should examine any woman in the clinic without previously having washed his hands with solution of chloride of lime, and having made use of a nail brush.

Even in June, it was impossible not to be sensible of the influence of this precaution. Out of more than 300 women that were confined in that month, only six died; in July, three out of about the same number; in August, three; in September, twelve; October, eleven; November, eleven; December, eight: whereas, in April, fifty-seven; and in May, thirty-six, cases had ended fatally. In the year 1848, the mortality amongst the puerperal women delivered by male pupils was 1 in 84; whilst, in the second clinic, amongst the women delivered by midwives, it was 1 in 76.

Since the year 1827, the rate of mortality in the hospital had never been so low. I need not say more, than that from the time when this precaution was introduced into the practice, up to the time of my leaving Vienna in November last—that is to say, for more than three years—the mortality in the two clinics has always been nearly the same,

which had never been the case since 1839—that is to say, since the time when the male and female pupils were exclusively confined to separate clinics.

A very similar observation was made at Kiel. Dr. Michaelis, professor of midwifery in the university of that town, wrote a letter to Dr. Semmelweiss, bearing the date March 18th, 1848, in which he informed Dr. Semmelweiss that they had been obliged, in 1847 (July 1), to shut the lying-in hospital because of the puerperal fever spreading fearfully. In November they opened the doors again, but a very short time afterwards the disease began again to make its appearance—so that they had already come to a determination to close the house for a second time, when the news of Dr. Semmelweiss' opinions, and the measures adopted in our lying-in hospital, reached Kiel (December 21st, 1847). From that time, up to the 18th of March, they had no case of puerperal fever excepting one, that was caused, as Dr. Michaelis believes, by a dirty catheter.

I must call your attention to some more facts which, as it appears, speak strongly in favour of the opinions of Dr. Semmelweiss.

In the course of those years when the post-mortem examinations were less frequent with us in Vienna, owing to the little importance attached to pathological anatomy, the puerperal fever was comparatively seldom met with; and this was certainly not explicable by the wards being less crowded than at present, as the one clinic of those former times contained—in comparison with its room—nearly as many women as the *two* clinics do now. You may recollect that I have stated before, that when first the second clinic was established its pupils included both midwives and medical students, and that in these days the mortality in its wards was not less than in the other clinic. It was only after the separation of pupils already mentioned, that the reports of the second clinic became much more favourable than those of the first clinic. They remained constantly so; with one striking exception, however, occupying the period between 15th October 1841, and 15th October 1843, when the mortality was much higher than usual, the then assistant being very busy in anatomical pursuits.

According to the reports of the lying-in houses in the whole empire of Austria, in none of those institutions where midwives have been the only pupils has a puerperal epidemic made its appearance; but it reigned obstinately in Pavia, where they used to dissect—in one of the rooms of the lying-in hospital—the bodies of the children who died in the hospital.

There existed, within the last few years, two clinics in Strasburg, as closely adjacent as those in Vienna, and divided on the same plan in reference to the pupils. The professors of Strassburg told me that they had always less mortality in the clinic to which the midwives were admitted, and that there was no instance of any epidemic in those wards.

While in search of the true cause of the prevalence of puerperal fever, the impression on Dr. Semmelweiss was unfortunately at first exclusively directed to the influence of post-mortem examinations, and the precautions that were already in practice were not resorted to in the case of a pregnant woman who was admitted into the lying-in hospital labouring

under cancer of the uterus. As several days elapsed before her confinement was over, and as the case was highly interesting, of course every one wished to examine her. The consequence of this was most deplorable. Fourteen mothers who had been confined at the same time with this woman, and who had been examined by the same students, exhibited puerperal spmptoms, and three of them died, although puerperal fever had not been prevailing immediately before, nor did any other case occur except these fourteen.

I think there can scarcely be any doubt as to the mode in which the matters of putrefaction act on the system. All the symptoms that are so often observed in the puerperal fever, and the more so the greater the number of patients at a time is, show clearly that it is phlebitis, ending in purulent infection, with which the women are seized. The rigors, the shivering, that prevail as the first symptoms, the dirty yellow discoloration of the skin, the metastatic deposits that are collected in the cellular tissue and in the articulations, are ascribed by most of the very eminent writers on the subject to purulent infection; and every accoucheur is aware, that those are also the symptoms of the most hopeless cases of epidemic puerperal fever. But allow me to observe that, as far at least as I am aware, purulent infection is never met with except in cases where the purulent matter comes in immediate contact with the blood, as is observed in punctures inflicted in dissections, that present quite similar symptoms, and end unfortunately too often in a similar way.

If the discharges of the uterus and the vagina were the true causes of puerperal fever in most cases, it would be decidedly very difficult to say why they did not infect the women in both clinics of the Vienna hospital with equal frequency.

Before concluding, I have only to express a hope that most of the great variations in mortality may be avoided in future by the greatest care after dissections, and by attention to cleanliness, the air of the wards, the instruments, linen, &c.

It is, however, my firm conviction that any individual who may not choose to submit to what we have stated to be necessary after the contact with matters in putrefaction, may artificially produce the puerperal fever on many persons whom he may successively examine, and who, in all probability, would never have become ill but for this inhuman carelessness.

Allow me, in conclusion, to state, that I know of no case of the puerperal fever having been communicated through the clothes of a medical man to a patient. As far as I know, there is no such case on record, neither in hospital nor in private practice in Vienna, where it had been possible to trace a puerperal fever to such a source. As to erysipelas, which I am aware is very often admitted in this country to produce puerperal fever, I feel myself bound to aver that erysipelas has by no means been most frequently observed in the Vienna hospital when we had epidemics of puerperal fever, nor did we find the children of the puerperal women seized with erysipelas. Scarcely one of our pupils, and none of the nurses, were taken with erysipelas during my stay in the Vienna hospital.

I have perused a good many of the histories of puerperal fever detailed in English periodicals and standard works, and I think nearly all the cases brought forward to maintain the possibility of bringing on puerperal fever by touching erysipelas, relate to cases of gangrenous erysipelas; the mode of propagation of which it would be very easy to explain by the views spoken of at length in this paper.—*Monthly Journal of Med. Science, June,* 1851, *p.* 505.

144.—*Case of Placenta Prævia.*—[A case of this kind having been published by Mr Nix, Mr. Molloy, surgeon, in a letter to the Editor of the 'Lancet,' says that, though Mr. N's practice is excellent, and worthy of all commendation, yet, his explanation is erroneous. Alluding to Mr. Nix's description.]

He remarks, "I passed my hand *through the placenta,* and by the feet brought down the child," a method of proceeding which could not have been adopted, simply, because it is impossible. Let us examine the case a little more narrowly, and it will become apparent that this assertion is not a truthful expression. The objects for our consideration, and with which we have to deal, are—1, the power—the hand; 2, the resistance—placenta; 3, the fulcrum—liquor amnii and fœtus. Now, if we attempt to force a passage through the placenta, one of two things will necessarily happen; either so much violence must be used as to offer the chance of uterine laceration, by the pressure exerted on the uterus, through the fœtus and liquor amnii; or else, what almost invariably occurs, a portion of the placenta gives way before the direct force employed, and the hand is thus admitted into the uterine cavity. But, for the sake of argument, I will admit that the hand has really made for itself a passage through the placenta, and that one or both feet have been brought through this orifice; let us then inquire what would next take place in the order of events. The placenta is so far elastic as to embrace tightly any considerable object projected through it, and would offer an insurmountable obstacle to the *then* passage of the child's nates and body—moreover, it has become for the time (by being thus situated) a part and parcel of the body of the infant, having only its own adhesion to the uterine walls to oppose to the powerful contractions of the uterus, or the extractive force, or, it may be, both combined. Hence there is no difficulty in concluding that the lesser power—the resistance—must give way to the greater; and were it even true, as is commonly supposed, that the feet have been brought through a lacerated placenta, the body being unable to pass in this way, the child would necessarily come into the world with the placenta adherent to its legs.

This is the conclusion which all might arrive at by the exercise of a little reason; but in order to make security further secure, let any person place a recent placenta in a wash-hand basin, and try to effect a passage through it, from either the fœtal or maternal surface; he will at once be convinced of the utter fallacy of expecting to perform in the uterus and under unfavourable circumstances, what he is powerless to effect with every advantage in his favour.

I am the more anxious to correct this error because it is one of ancient date, and is repeated in nearly all obstetric works, even in those the latest published. The directions usually given are "that in cases of placental presentation, turning must he accomplished either by passing the hand between the placenta and the uterus, or through the substance of the placenta." Such a statement as this, supported by the names of Drs. Denman, Ramsbotham, Conquest, and others, propagated without inquiry, is received without question, and might be productive of serious results if attempted to be carried out in practice. At all events its detection will leave us to contend with one mistake the less, and at the same time prove a useful hint to the members of the profession generally to cultivate habits of self-thought—self-reliance—in preference to the too exclusive dependence upon the "verba magistri."—*Lancet, Sept.* 13, 1851, *p.* 253.

145.—ON FATTY DEGENERATION OF THE PLACENTA.

By Dr. Robert Barnes, Obstetric Surgeon to the Western General Dispensary, Lecturer on Midwifery, &c.

[Many eminent physiologists agree in the conclusion that fatty degeneration is destined to occupy a very prominent position in general pathology. Its importance and interest is at once shown from its occurrence in such vital organs as the liver, kidneys, heart, &c. There are no sufficient data to establish the opinion of its hereditary nature. But being the organ through which the embryo derives the materials of its growth from the mother, is strong presumptive evidence that the germs of disease circulating in the blood of the mother, may be directly transmitted to her offspring.]

In support of this view, that the placenta may be the medium through which the various morbid diatheses may be propagated from the mother to the embryo, and also as affording further proof that the placenta is nowise exempt from those diseases which affect the permanent organs of the female, it deserves to be remembered, that the placenta may be attacked by inflammation and congestion; that it may be the seat of the deposition of fibrin, cartilage, bone, and even cancerous matter; and the case of a phthisical patient is related, in which small crude tubercles were formed on the external surface of the uterus, under the peritoneum, and eight or ten on the uterine surface of the placenta.

With regard to the frequency of fatty disease in the placenta, it is at present difficult to form an accurate opinion. I am in the habit of minutely examining the placenta on every opportunity; and I have not unfrequently seen fatty masses in various stages of growth in placentæ expelled at the full period of gestation. In these cases it is to be presumed, that the balance of healthy placenta preserved was sufficient for the development of the fœtus. There are certain physiological considerations which render it probable, that the placenta is especially prone to become the seat of fatty deposition. The decarbonising function of that organ is one; but there are several others which deserve attention.

Pregnancy itself appears to predispose to the formation of fat. The increased proportion of fibrin in the blood; the tendency to albuminous urine; the constant presence of fat in that secretion; the secretion of fat in the breasts; and the observation that a certain amount of free fat is always present in the healthy placenta, constitute a series of facts, which, viewed in their relation to each other, may elucidate those morbid processes which lead to the production of an excess of fat in the circulating system. Certainly, the elimination of this material from the economy, is obstructed by the encroachment on the cavity of the chest, the pressure upon the liver, kidneys, and other abdominal organs, and the growing disinclination to exercise, which attend the progress of gestation.

The observation of fatty degeneration in the placenta presents another point of interest with reference to the study of the general pathology of that disease. It furnishes an example of the *rapidity* with which it may proceed, which is capable of close limitation. The placenta being a caducous organ lasting but a few months, all the pathological changes observed in it, we know, must have been wrought within a certain brief period of time. When we find, therefore, that the disease has proceeded from simple deposition to degeneration, and even disintegration of the original tissues in a placenta expelled at the seventh month of pregnancy, we are in possession of accurate data by which to form an estimate of the rapidity with which these changes may occur. No similar data can be obtained with reference to the like changes in other organs.

I will not, however, dwell longer upon the general relations of fatty degeneration of the placenta, as I am anxious to advert to the practical bearings of the disease on obstetric practice.

The effects that must result, sooner or later, according to the rate of increase of the morbid alteration of an organ so essential to the fœtus as the placenta, are not difficult to understand. In exact proportion as the growth of the embryo requires a larger and more unimpeded extent of placental structure, in which its blood may be brought into multiplied points of contact with the blood of the mother, large portions of placenta are being gradually rendered useless for this purpose; and the coats of the villi throughout the remainder are probably undergoing a disorganisation which must materially impede the performance of their function, of permitting the interchange of elements between the maternal and fœtal blood. If this conversion of healthy placental structure proceed at such a ratio as to exceed the normal increase of healthy placental tissue, a period must arrive when the healthy portion of placenta will be insufficient for the production of those changes in the blood of the fœtus which are essential to its growth and life. When this period arrives, then, the fœtus will perish, and premature labour will follow—unless, indeed, premature labour be induced during the life of the fœtus by a process to which I will next advert.

One of the conditions essential to the perfect cohesion of the placenta to the uterus, is the preservation of the uniform spongy structure of the placenta. The whole uterine surface of the placenta must present an equal consistence, so that every part may permit of equable distension, whether from the maternal or the fœtal circulating system, and

be equally adapted to the opposing surface of the uterus. This condition is necessary to enable it to preserve this adaptation throughout the peristaltic movements to which the walls of the uterus become more and more liable as gestation advances. But when, as is the case in these examples of fatty tumours in the placenta, certain parts of the uterine surface are hard and unyielding, while intervening portions are of a soft and yielding character, the entire placenta is no longer in a condition to follow the movements of the uterus and preserve its connections. The hard portions, moreover, in which fat has occupied the walls of the fœtal vessels, and by pressure obliterated the cavernous structure, no longer maintain any vascular communication with the uterus. The maternal or cavernous portion of the placenta being either closed up, or otherwise rendered useless, the channels of communication with the uterus necessarily disappear. Accordingly, in these portions no oblique valvular openings, no remains of arteries, could be discerned, such as usually exist, and such as were observed on the maternal surface of the more healthy portions of the diseased placentæ. The consequence of this loss of homogeneity of tissue, and cessation of vascular connection with the uterus, is, that when the peristaltic movements of the uterus assume an active character, as they often do towards the seventh month of pregnancy, or even earlier, the cohesion between the placenta and the uterus is soon destroyed at those points where the fatty masses are largest and hardest. This partial disruption can hardly occur without involving some separation of the placenta not diseased, in the immediate proximity of these masses. Hemorrhage results; the effusion of blood and the formation of coagula excite increased action of the uterus; further detachment follows; premature labour is imminent; and if it ensue immediately, the child may be born alive. But this event may not occur on the first appearance of flooding, as the first case I have related will show. Should it not so happen, the favourable opportunity for the child will be lost. That amount of disease which is sufficient to cause partial detachment of the placenta is scarcely compatible with prolonged life of the fœtus; and in all probability, the fœtus will have been cut off from defective nutrition, before a further detachment and hemorrhage could bring about the expulsion of the contents of the uterus.—*Medico-Chirurgical Transactions, Vol.* xxxiv, *p.* 191.

[On the discussion of this subject at a meeting of the Royal Medical and Chirurgical Society,]

Dr. C. J. B. Williams considered that attention should be directed to the nature of fatty degeneration in relation to that class of changes constituting cachexia, and exhibiting itself in a great number of diseases. It appeared, he said, the fashion to regard degenerations as independent changes, and as if fatty degeneration were as worthy to be considered a separate disease as cancer, tubercle, &c.; he said there was a natural tendency of the various products to undergo the change from the albuminous to the fatty. Mr. Gulliver has referred, he observed, to this change in the fatty or atheromatous deposit of arteries, in pointing out the analogy between the chemical formation of fat and the formation of adipocire. Dr. Quain had fully laid this subject before the Society, but

neither the Society nor profession, he thought, appeared to be sufficiently aware that this is a chemical change, and forms a part of the several morbid processes from a degradation or failure in degree of the vital processes; that similar changes took place both in and out of the body when not decomposed; that it always took place in almost every part of the body under degraded nutrition with destruction of material, and in almost all inflammatory diseases: the circulation being obstructed, the nutrition is not developed, and fat is generated. In fibrous membranes, and on the pleura, the microscope showed a formation of fat where organization had not taken place; lymph, if not absorbed or organized, becomes fat. He further observed that blood has been converted into fat, as has been observed in apoplectic clots, he supposed that in the placenta the circulation becomes obstructed by an inflammatory process. Hypertrophy may result, and from degraded nutrition undergo the change, but this he considered a matter of doubt. This was the original cause of many abortions: in conclusion he referred to the changes observed frequently in the ovaries, where hair and fat have both been frequently observed, and appeared to think that the fatty changes, both in the liver, kidneys, and placenta, might be explained on the view of having not been sufficiently brought under the influence of nutrition.—*Med. Gazette, May* 23, 1851, *p.* 913.

146.—*On a Form of Sanguineous Pelvic Tumour in Females.*—M. Nelaton calls attention to a peculiar form of tumour, hitherto much neglected by authors. These tumours are usually preceded by some general symptoms, as *malaise*, disturbed menstruation, pains in the hypogastrium, and a feeling as if a heavy body were about to escape from the vagina. The abdomen is sometimes enlarged, and a hard, very painful tumour is felt by the patients in the hypogastric region; in other cases, they are not aware of its existence, and, when it is pointed out to them, they cannot say how long they have had it. On examination, the abdomen is found to be inflated, tense, convex, and painful. The decubitus is dorsal, with the thighs flexed on the pelvis. By palpitation in the hypogastrium, a tumour is felt in the cavity of the pelvis *(petit bassin)*. This is sometimes confined within its inner border, and sometimes extends as high as the umbilicus: it is commonly inclined towards the right iliac fossa. The tumour is small, rounded, without knotty projections, and becomes gradually lost in the pelvic cavity; it is scarcely moveable, and is of pretty firm consistence, sometimes presenting fluctuation. On vaginal examination, there is found, between the uterus and rectum, a tumour, advancing towards the orifice of the vulva in proportion to its size. It is smooth, rounded, and fluctuating, varying from the size of a large goose-egg to that of a thumb, without pulsation or expansive movement: it may narrow the vaginal canal so as only to permit of the passage of the index finger. The uterus may be raised by the tumour, so that its body is felt above the pubes; and its neck may be so much elevated, that the forefinger can only with great difficulty reach it.

The treatment of these tumours consists in evacuating the liquid which they contain. M. Nélaton proposes to employ a large trocar, and then a simple lithotome to enlarge the opening. The patient is placed on her back, on a tolerably high bed, with her legs and thighs bent, as in the position for lithotomy. By introducing a speculum into the vagina, the tumour is discovered towards its base, at the posterior wall. The point where fluctuation is most apparent having been discovered, a long trocar is introduced, with a canula sufficiently long to allow the escape of the matter, which is liquid, black, and viscid, like treacle. The incision ought generally to be three *centimètres* in extent; it should be made in the axis of the vagina, so as to avoid wounding the uterine arteries. It should also be carefully ascertained that there are no arteries on that part of the wall in which the incision is made. The incision should neither be too wide nor too deep, so that the rectum may be avoided. When, some days after the operation, the liquid which escapes has become purulent and fetid, disinfectant injections should be employed. The strength of the patient should at the same time be supported by quinine and other tonics. The walls of the tumour should also be explored with a scoop (*curette*), so as to remove any adherent clots, which may be in a state of commencing putrefaction. *Gazette des Hôpitaux.—London Journal of Medicine, June,* 1851, *p.* 565.

147.—*Spontaneous Cure of Ovarian Tumours by Discharge of their Contents through the Fallopian Tubes.* By Dr. James Robertson, F.R.C.S., Physician to the Infirmary, Hitchin.—[The following case occurred to Dr. Robertson some years ago, and to the notes of which he had an opportunity of adding the post-mortem appearances.]

Mrs. ——, a delicate, strumous, married young woman, consulted me in June, 1847, regarding her enlarged abdomen. She said that now her abdomen had enlarged gradually for some months, but more rapidly within the last two months; it was as large as, and of similar appearance to, that of a pregnant woman at her full time. She had menstruated regularly; did not think she had ever been pregnant; passed but a small quantity of milky-looking urine. A fluctuating tumour filled the pelvis, pressing on the rectum and vagina; the uterus was distinguishable, high up, but small. A catheter was passed: the bladder was empty. She told me she had a similar swelling about a year before this time, which ended by an immense discharge from the vagina. She attributed this first attack to over-exertion in walking; her health had been very delicate for some years. She suffered much from dysmenorrhœa. A few days after this, whilst in bed, suddenly a great discharge of most abominably stinking, white, slimy fluid, with a quantity of white and greenish flakes and pieces of bladder-like substance floating in it, enough to fill two full-sized chamber-pots, took place per vaginam. The abdomen resumed its natural size; the discharge in four months diminished to a mere weeping. She now had symptoms of phthisis, and died in September, 1848.

On making examination after death, we found old adhesions plentiful

about the lower abdominal and pelvic regions, attaching the various viscera together. In the right ovary was a cyst as large as a medium-sized orange, with a very ragged interior, containing some fluid like that discharged; it was much corrugated and collapsed, and communicated with the fallopian tube, on which were two other cysts of the same appearance as the other, but about one-fourth the size; there was also one cyst, unruptured, as big as a small orange, filled with glairy fluid, in the same ovary. In the left ovary was a cyst of precisely the same appearance as that first described, but empty, communicating with the left fallopian tube. The fallopian tubes were dilated; the uterus was sound, but harder than usual throughout.

The following is somewhat similar, but not so complete:—

Mrs. G——, a cachectic, strumous, married woman, aged thirty-six, not having been pregnant, and who menstruated regularly, observed, about sixteen years ago, (this was in December, 1848,) a fulness in the right iliac region, which had since gradually become greater, and which, on examination, presented the usual signs of an ovarian tumour, she being at this time as big as if about seven months gone with child. In February, 1849, she found herself one morning, on waking, in a pool of "blood and matter" up to her shoulders, which had escaped per vaginam. A considerable discharge continued for some time, but in six months had nearly ceased, her general health had improved, and the abdomen resumed its natural size. She is now (September, 1851) in pretty good health, and the contents of the pelvis appear healthy.—*Lancet, October* 11, 1851, *p.* 343.

148.—*On the Management of Women after the Cessation of Menstruation.* By Dr. E. J. Tilt.—[The superabundance of blood and nervous energy after the cessation of the menstrual flow may be safely and effectually kept down by the habitual use of small doses of purgatives; and, as these may have to be continued for some length of time, it is best to consult the patient as to what medicine would be best tolerated. The purgative to be used depends upon the constitution of the patient. Perhaps the best is some mild purgative which has been found to agree with the patient. Dr. Tilt continues:]

I frequently prescribe the soap-and-aloes pill of the Edingburgh Pharmacopœia, ordering five or ten grains to be taken with the first mouthful of food at dinner. Hemorrhoidal affections I have never seen *caused* by this frequent use of aloes, but I have seen them *relieved* by it; and as I read in Giacomini's 'Treatise of Materia Medica' my experience on this point is confirmed by that of Avicenne, Stahl, Cullen, and his own, so I think there must be some exaggeration as to the extraordinary property generally ascribed to this valuable drug, which can be associated with hyoscyamus, and is thus said to be less liable to induce piles. Kemp and Hufeland recommend the following powder to be given to those who are advanced in years, and who complain of a tendency to vertigo:—Guaiacum resin, cream of tartar, of each half a drachm, to be taken at night. This, no doubt, will sometimes be found a useful laxative: so will the popular remedy called the Chelsea Pensioner, of which

Dr. Paris has given the following formula in his excellent Pharmacologia: —Of guaiacum resin, one drachm; of powdered rhubarb, two drachms; of cream of tartar and of flowers of sulphur, an ounce of each; one nutmeg finely powdered, and the whole made into an electuary with one pound of clarified honey: a large spoonful to be taken at night. I generally administer the flour of sulphur alone, or else to each ounce of it I add a drachm of sesquicarbonate or biborate of soda, and sometimes from five to ten grains of ipecacuanha powder. One to two scruples of these powders, taken at night in a little milk, is generally sufficient to act mildly on the bowels, and I consider such combinations as very valuable when a continued action is required.

I feel obliged to class sulphur amongst purgative remedies because such is its visible action, but I believe that it owes its chief value, in diseases of cessation, to another action, much more difficult to understand, and which has long rendered it so valuable both in hemorrhoidal affections, where there is an undue activity of the intestinal capillaries, and in skin diseases marked by a morbid activity of the cutaneous capillaries. Whether sulphur cures by acting on the nerves or on the blood-vessels, or by modifying the composition of the blood itself, is difficult to tell, but it does certainly cure the diseases I have enumerated. It forms part of many popular remedies for the infirmities of old age, was recommended by Hufeland, and is lauded by Dr. Day in his work 'On the Diseases of Old Age;' but its utility is not generally known in all derangements of the menstrual function, at whatever period of life they may occur, and particularly at the change of life, where, if required, its action may be continued with impunity for months and years.—*Provincial Med. and Surg. Journal, October* 1, 1851, *p.* 547.

149.—*On the Obstetric Use of Ergot of Rye.* By Dr. George E. Ely, Rochester.—The case in which ergot is most strikingly beneficial, and I may say most necessary, is that of partial presentation of the placenta. Here, until the os uteri is considerably dilated, the hemorrhage can only be stayed by the plug, which will do so effectually. But when the os is tolerably open, thin, and soft, the yielding membranes will not afford a counter-pressure to the plug, which is then no longer efficient. They may also give way without our knowledge, and then we shall have internal hemorrhage. If we now rupture the membranes, the descent of the head will so compress the lacerated vessels, as to place the patient in safety. But we cannot depend upon the continuance of sufficient contraction of the uterus to keep up this compression; and the intervals of pain will permit a considerable draining. Here, then, if the symptoms are urgent, there would be no remedy but turning; a measure painful and exhausting to the mother, hazardous to the child, and perhaps difficult to the operator. But ergot supplies, as I can aver, an admirable and a competent aid. Let a full dose be given, and the membranes ruptured, and the happy results will be, a cessation of hemorrhage and a speedy delivery; or, at all events, such a degree of tonic contraction of the uterus will ensue, as will keep the patient out of danger.—*London Journal of Medicine, November*, 1851, *p.* 979.

150.—NEW FORCEPS FOR THE REMOVAL OF UTERINE POLYPI BY THE COMBINED INFLUENCE OF PRESSURE AND CAUSTIC.

By Dr. M. M. O'Grady, M.R.I.A., Malahide.

The difficulties which have occurred to me, in common with the most experienced practitioners, in operating with the instruments ordinarily employed for the extirpation of uterine polypi, induced me to turn my attention to the construction of a forceps by which the operation might be simplified and effectually performed without the necessity of confining the patient to bed, or of exposing her to the risk of being injured by the presence of the double canula in the vagina during the time the ligature takes to cut through the pedicle, or to any of the other disagreeable consequences attending this mode of operation.

Having operated seven times successfully with the instrument hereafter described, without causing the least pain, and without the patients losing a drop of blood during or subsequently to the performance of the operation, I am induced to lay a description of it before the profession; I will also add a brief account of two cases, which suggested to me the idea of its construction, and of combining mechanical pressure with the action of nitrate of silver upon these morbid growths, The instrument was made under my immediate direction, by Thompson and Co., of Henry-street.

The entire length of the forceps is ten inches, and that of the blades, measuring from the pivot to the extremities, five inches and a half, each blade terminating in a semi-tubular chamber, of about half an inch in length, closed and rounded at the extremity, and open on the inner surface, so as to form a groove for the reception of a piece of caustic.* Both these chambers having been charged, and the forceps shut, the caustic is completely enclosed; it is thus introduced into the vagina or os uteri with perfect safety. When the blades are separated for the purpose of seizing the object to be operated upon, the caustic can come in contact only with the substance grasped by the forceps; its action

* I had the portion of the instrument in which the caustic was included made of silver. Platinum or gold would of course answer better; but Dr. Carte suggested to me that a coating of gutta percha would be as effectual, and, I need not say, very much cheaper.

then is two-fold; first, the edges of the caustic chambers break down the vessels of the polypus by compression; and secondly, the caustic decomposes its substance with great rapidity. The forceps is withdrawn as soon as all resistance to its pressure appears to have yielded, and the parts are then washed out with a solution of carbonate or hydriodate of potash, which decomposes the caustic and prevents its acting on the os or cervix uteri. The patients, with the precautions usually adopted, may safely be permitted to walk or drive out, as if no operation had been performed; and at his next visit the operator will find the polypus loose in the vagina, if not already discharged into the night-chair.

Case 1.—On the 10th of September, 1848, I was sent for in a hurry to see Mrs. W., aged 39. She was pale and faint from loss of blood. Upon examination, there was a large fleshy mass protruding between the labia pudendi; it bled freely from many points of the exposed surface, and on introducing the finger I found that the tumour passed through the os uteri, and nearly filled the vagina. She could not have lost less than twenty ounces of blood during the last twenty-four hours. She was the mother of six children, and had a bad miscarriage about two years before; she had suffered from vaginal discharge since then, and occasionally lost considerable quantities of blood at the regular monthly periods. Not being prepared for the nature of the case, I had neither speculum nor ligature, and being obliged to act at once to arrest the hemorrhage, it occurred to me to apply to the bleeding surface the nitrate of silver, which I always carry about me, having been in the habit, for at least twenty years, of using it extensively in inflammation of the throat and fauces, and latterly in ulceration of the os and cervix uteri. I was surprised at the rapidity of its action upon the polypus, which it reduced for at least one inch to a black carbonaceous mass. It arrested the hemorrhage instantaneously, and enabled me to leave my patient in a state of security in less than an hour, cautioning her at the same time to send for me if there was the least return of the bleeding. On the day following I found this lady cheerful and in excellent spirits, although naturally weak from the loss of blood. There had been no return of the hemorrhage since I left her. I now introduced Fergusson's speculum, which the polypus filled. Having this shade for the vagina, and encouraged by the result of the application of the caustic made the day before, I destroyed another portion of the polypus in a very short time. Still apprehending a return of hemorrhage, I used the precaution of plugging the passage, but I found this at my next visit to have been wholly unnecessary, inasmuch, as not a single drop of blood had been lost. In a week the polypus was destroyed up to the os uteri, which, being in a healthy state, closed upon the remainder.

I mentioned to this lady that the polypus was not entirely extirpated, and that it was likely to be reproduced, and told her in the event of the recurrence of the symptoms, to send for me. I did not hear from her again until the 14th of March, 1849, when I was again summoned to see her. I found her suffering much from bearing-down pain, which she had had for the last week, and upon introducing the speculum a polypus was seen, about two inches long, issuing from the os. Having, in the meantime, operated upon another patient with the forceps I have described, I had no difficulty in securing and destroying this polypus

within the cervix, from which it grew. The entire operation did not last five minutes, and the lady dined with her family that day. She has since had one child, and has continued to enjoy the best health.

Case 2.—In February, 1849, I was consulted by Mrs. M., aged 58. She married young, is the mother of ten children, and had several miscarriages. I attended her in four confinements, the last fifteen years ago. Her general health was always good until the age of 56 or 57, when she had leucorrhœa and pain in her back, with bearing-down upon taking exercise. For the last three months the discharge has been more profuse and high-coloured, and for two or three days back she bled freely from the vagina. She is now pale, nervous, and very much alarmed about herself. Upon examination, I found a fleshy mass in the vagina, which bled freely from one point. I introduced Fergusson's speculum, by which a polypus at least four inches long, and issuing from the os uteri, was revealed. Having found the nitrate of silver in Mrs W.'s case so efficient, I applied it freely to this polypus, and with the like happy result; the bleeding ceased at once, and never during the subsequent treatment returned.

Having succeeded in destroying a great portion of the polypus by the caustic, I repeated the application the next day. The forceps, now rudely finished, and charged with caustic, came to my assistance. With it I seized the remainder of this polypus, at its origin in the cervix, from which it grew, and with great rapidity broke it down and reduced it to a black carbonaceous pulp; no blood was lost in any stage of the operation.

As my object in narrating these cases is to introduce this forceps, and the mode of operating with it, to the notice of the profession, I will merely remark, that I removed two more polypi of a similar character from this lady, all of which grew from the interior of the cervix uteri, the last in September, 1850, and that I saw her yesterday, July 16, 1851, in as good health and spirits as ever she enjoyed. She assured me that she has not suffered the slightest inconvenience or return of any of the symptoms since the last operation.—*Dublin Quarterly Journal of Med. Science, August,* 1851, *p.* 232.

151.—*Gelatinous Polypus—New Polypus Forceps.*—Mr. Harvey exhibited to the Medical Society of London a gelatinous polypus, which he had extracted from the ear by a new kind of forceps which he had invented for the purpose. He observed that in these cases it was most desirable that the morbid growth should be extracted entire; for if it was broken or otherwise injured in attempts at its removal, it gave rise to much inconvenience, and required tedious and troublesome after-treatment. The forceps which he had constructed, and which he had been in the habit of using for a long time with satisfactory results, were not dissimilar to those of Assalini, but had a somewhat longer blade, were flattened on either side, and terminated with three rows of teeth. The foreign body was firmly grasped by these teeth, and removed by a rotatory motion, the instrument admitting of that. This Mr. Harvey regarded as of great importance to the operator on the ear. It was also sufficiently small to admit of being used with a bivalve speculum in the auditory canal, the operator being thus afforded an opportunity of investigating the origin of polypi.—*Lancet, Oct.* 25, 1851, *p.* 393.

ADDENDA.

152.—ON THE PHYSIOLOGY AND PATHOLOGY OF THE PHOSPHATE AND OXALATE OF LIME, AND THEIR RELATION TO THE FORMATION OF CELLS.

By Dr. William Beneke, Resident-Physician at the German Hospital, Dalston.

[In a small work lately published in Germany, the author has established the following results.]

1st. Just as in plants and inferior animals the phosphate of lime is indispensably necessary in man for the formation of cells, this formation does not only depend upon the presence of albumen and fat, but likewise upon the presence of phosphate of lime.

2ndly. The want of phosphate of lime, either in plants or animals or men, causes a deficient formation of cells; and a great many pathological states of the system really seem to depend upon a deficiency of phosphate of lime.

3rdly. In accordance with these general laws, we must suppose that we are enabled to cure, or at least to alleviate, by the internal administration of phosphate of lime, diseases marked by emaciation, formation of ulcers, in one word, by a deficient formation of cells.

4thly. I have shown by my experiments, that such really is the effect of the administration of phosphate of lime;—that is to say, I have produced, by the internal administration of phosphate of lime, an undoubted increase of the cell-formation in diseases evidently showing a diminished formation of cells.

5thly. As diseases or affections of this kind, which have come under my observation, I have to mention,—

a. Ulcerations of any part of the system, which are based upon general dyscrasia, such as scrofula, and which are not merely local affections.

b. Infantile atrophy, especially the well-known atrophic state of children, suffering from rickets, and its accompanying symptoms, as diarrhœa, &c.

c. Tuberculous disease, more especially of the lungs, in its earliest stages.

6thly. There seems to be a remarkable connection between scrofula and deficiency of phosphate of lime. But as it generally ought to be mentioned, that we shall never be able to produce an increase of the formation of cells, unless we administer a wholesome, preferably nitrogenous diet; so it must be considered that the deficiency of phosphate of lime

is only a constituent part of these diseases; and by its mere use we are very well enabled to remove symptoms, which depend on its deficiency, but by no means shall we cure thereby the dyscrasia *in toto*.

[The following is the chief point of the facts on which these conclusions are founded, viz., the great importance of inorganic substances in the formation of organic compounds. Liebig pointed out this fact with regard to the organic compounds of plants, these depending in some measure upon the presence of the inorganic constituents of the soil. And hence we must be induced to suppose that a similar relation exists in animals, and even in men. Dr. Beneke even supposes, that in these organisations the inorganic are quite as essential as the organic compounds.]

It is not here the place to enter more deeply into these views. I have only to show how far we are acquainted with the relation of phosphate of lime to organic compounds, and even to the formation of cells.

In first considering plants, we have been informed by Liebig that the salts of phosphoric acid are indispensably necessary for the formation of nitrogenous compounds as well as of cells. In his elaborate work, 'Organic Chemistry in its Application to Agriculture and Physiology,' the author affords a great many proofs of this result, out of which I beg to select a few. "None of our plants," as we read in page 100, fifth German edition, "can bear perfect seeds—that is, seeds yielding farina, without a large supply of phosphates and even ammonia, substances which they require for their maturity. In the stems and leaves of plants we find salts with alkaline bases; the azotic compounds we find always accompanied by salts of phosphoric acid, and we therefore must suppose that they are of the greatest importance in the economy of plants. The alkaline bases are principally wanted for procuring sugar, gum, pectine, and amylum—substances which do not contain nitrogen; on the other hand, the salts of phosphoric acid are principally necessary for the formation of azotic compounds." (p. 251). These interesting remarks are based upon facts which do not admit of any doubt; they apparently prove the remarkable relation between the salts of phosphoric acid and azotic compounds in plants. But there is another point we have to direct our attention to, and this is the most important with respect to my present purpose. At page 138 Professor Liebig says: "We know that the quantity of starch in potatoes increases when the soil contains much humus, but decreases when the soil is manured with strong animal manure, *although in this case the number of cells increases*, the potatoes acquiring in the first case a mealy, in the second, a soapy consistence. Beet-roots taken from a barren, sandy soil, contain a maximum of sugar, and no ammoniacal salts, and the Teltowa turnip loses its mealy state in a manured land, because all the circumstances necessary for the formation of cells are there united." Well then, we must trace the causes of the peculiar influence of the manure on the formation of cells, and in referring to its constituent parts, and the experiments which have been made on their relative power, we shall be far from admitting the least doubt that the salts of phosphoric acid are those materials,

upon the presence of which the formation of cells depend. This view is still farther proved to be correct by our finding that for manure of animal excrements, other substances, containing their essential constituents, may be substituted. "In Flanders (Liebig, 'On Agricultural Chemistry,' English translation by Playfair, 1840, page 182) the yearly loss of the necessary matters in the soil is completely restored by covering the fields with ashes of wood or bones, which may or may not have been lixiviated, and of which the greatest part consist of phosphates of lime and magnesia. The great importance of manuring with ashes has long been recognised by agriculturists as the result of experience. Its use will be at once perceived when it is considered that the ashes, after having been washed with water, contain silicate of potash in the same proportion as in straw, and that their only other constituents are salts of phosphoric acid." Finally, Liebig adds the important remark, (German edition, page 245), that we may furnish a plant with carbonic acid and all the materials that it requires; that we may supply it with humus and ammonia in the most abundant quantity, but that it will not produce albumen, fibrine, and caseine, unless the salts of sulphuric or phosphoric acid are afforded to it. "We ought to suppose that without their co-operation, the ammonia does not influence in the least the formation of the nitrogenous substances."

This, then, is the result of the foregoing remarks: that the azotic compounds in plants are not produced without the co-operation of the phosphates; that the produce of cells increases proportionately to the power and quantity of the manure afforded to the soil, and that this power particularly depends upon the presence of phosphates, the other salts really being of no great importance in this respect.

But there are different sorts of phosphates contained in the soil, such as phosphate of soda, phosphate of lime, phosphate of magnesia, and phosphate of iron. Is there any reason to believe one of these several substances to be more important for the produce of nitrogenous substances and cells than the others? Facts are not wanting which afford an affirmative answer to this question. The single experience that we may considerably increase the produce of nitrogenous substances and cells by the manuring the land with ashes of bones, is quite sufficient to prove that the phosphate of lime is of the greatest importance in this respect. A great many analyses of ashes of bones, communicated in the 'Annalen für Pharmacie und Chemie von Liebig und Wöhler,' by Enderlin, Fresenius, and Will, and the analyses of bones by Berzelius, evidently show that the phosphate of lime is always present in ashes in a certain proportion, according to the nutritive power of the plants and the soil from which they are taken; and that, on the other hand, the proportion of phosphate of magnesia and soda in bones themselves is too small to partake of the influence exerted upon the soil by manuring it with bones. Berzelius found in 100 parts of dry bones, 53·04 phosphate of lime; 1·16 phosphate (carbonate?) of magnesia, and 1·20 soda, with a small quantity of chloride of sodium.

On these facts, then, I have founded the conclusion, that the phosphate of lime is indispensably necessary for the formation of cells in plants.

With regard to the inferior animals, and the part which is performed in their economy by the phosphate of lime, I have only to mention an excellent paper by Dr. Carl Schmidt, 'Zur vergleichenden Physiologie der wirbellosen Thiere. Braunschweig, 1845.' In this paper Dr. Schmidt communicates most interesting experiments, from which it becomes evident, that the phosphate of lime has an intimate relation to the formation of cells. Dr. Schmidt ascertained beyond a doubt, that in the articulata the quantity of phosphate of lime increases or decreases proportionately to the quantity of chitin, a sort of colourless, transparent tissue, which is not soluble in water, alcohol, ether, and liquor potassæ, and forms the principal constituent part of the skeleton of all the invertebrata. Now, this tissue is the result of an active formation of cells during the period of changing the integuments in these animals, and so it results that the quantity of cells formed is proportionate to the quantity of phosphate of lime present. The result becomes still more evident from the experiments which Dr. Schmidt describes in the following words: —"By carefully and gradually scraping off the outside of the hard scales of the thorax and of the claws of crabs to the upper pigment-layer of the subjacent membrane, I produced an exudation of new matter. This quickly took place, and, after the lapse of eight hours, a thickish, viscid, transparent mass (cyto-blastema) was to be found. This mass contained a large quantity of corpuscles, which did not dissolve in water, nor in acetic acid (fat), and others, which were soluble in water and acetic acid (albumen). No other corpuscles were present. When this mass was incinerated, a remarkable quantity of phosphate of lime (about eight per cent.) resulted, besides a small quantity of alkaline phosphates and carbonate of lime, the latter being the result of the incineration. The phosphate of lime was held in solution in the mass itself, as was proved by the turbidity resulting from the addition of a drop of ammonia to a drop of the liquid placed under the microscope. After the lapse of fourteen to sixteen hours the soluble molecules (albumen, and very likely phosphate of lime) surrounded the fat-globules, exhibiting in this way globular masses. Some of these masses were covered already by a membrane, so as to form cells, others not. At the same time numerous rhomboidic crystals (carbonate of lime) appeared. By the addition of liquor potassæ a swelling of the cells and their molecular contents took place; afterwards they became transparent and dissolved; the fat-globules were recognised as forming the nuclei of these cells. The cells did not yet present themselves as chitin. But after twenty-four to thirty-six hours several of these cells were extended, spindle-like; they swelled still by the addition of liquor potassæ, but they did not dissolve more in this stage; and appeared to be of the chitinous disposition." These experiments are followed by others which afford a negative proof in favour of Dr. Schmidt's views alluded to. In examining, namely, the calcareous scales of helix, and their interior, transparent, *structureless* membranes, he observed that no phosphate of lime was present, and accordingly no cells were found; nothing could be detected but amorphous, hardened, mucous masses, separated by layers of carbonate of lime. Dr. Schmidt himself says: These observations really are so striking as fully to confirm the opinion before advanced;

and he further adds as his firm belief, that a certain combination of albumen and phosphate of lime, or better, that a solution of albumen, which is saturated with the phosphate of lime, is particularly enabled to coagulate by the contact of heterogenous substances, and to form membranes around them—that is to say, walls of primary cells.

Well, then, having become acquainted with these remarkable facts, I put forward the question, whether the phosphate of lime might not have the same relation to the formation of cells in the higher classes of animals, and even in men, as it has been shown to have in inferior animals and plants? I have been fortunate enough to obtain satisfactory and affirmative results.

The way in which I tried to solve the question was a double one—first, I had to prove that wherever we find a formation of cells, the phosphate of lime is present, and *vice versâ*, that the phosphate of lime is wanting where no formation of cells takes place; secondly, I had to show that the phosphate of lime is indispensably necessary for, and that it really influences, the formation of cells.

With respect to the first point, I examined a great many pathological exudations, such as the serum produced by blisters, the exudations and secretions of wounds and ulcers, &c. &c.; and I have shortly to state, that wherever a formation of cells took place, the phosphate of lime was found in considerable quantity, and wherever it was absent, I could scarcely find traces of phosphates. In order to detect the smallest quantities of phosphate of lime, I used the microscope, which shows the most beautiful crystals of sulphate of lime, if a preparation, containing the phosphate, is mixed with a small drop of sulphuric acid, and no crystals at all where no lime is present. However, it is requisite, for a microscopical examination of this kind, to be well acquainted with all stages of the formation of the sulphate-of-lime crystals, so as to be enabled thereby to judge whether the quantity of phosphate present is a large or a small one; the former being the case, we shall observe a rapid and splendid formation of large crystals; the latter taking place, only the former stages of the crystal formation are to be detected.

First, I examined the serum which was drawn by blisters. It is rather difficult to detect the phosphate in a single drop of the unaltered serum in the way described, the quantity of lime really being a very small one. However, in a single drop I detected crystals of the smallest size, by the addition of sulphuric acid, and by continued examinations, I found that the crystals presented themselves the more quickly and well marked the sooner the formation of pus-globules took place in the serum, which was left beneath the skin. But from twelve to twenty-four hours are often required for the formation of crystals, and the preparation should not be judged of until during the lapse of this time repeated observations have been made. If, on the other hand, I slightly evaporated the serum in a hot-water bath, and now mixed a drop of the evaporated serum with sulphuric acid, a rapid formation of crystals generally took place, which undoubtedly showed the phosphate of lime to be present in large quantity. I then examined exudation-matter of wounds and ulcers, and these observations really afforded the greatest interest; they decidedly proved the relation of the phosphate of lime to

the formation of cells. It will be well known to every accurate observer, that during the time of cicatrization of wounds and ulcers, two different sorts of exudation generally take place. First, an exudation appears, which I should like to call "spurious exudation," and which really exhibits nothing but a natural cover for the part affected or wounded, being far different from what we call "spurious granulations;" this exudation is subsequently thrown off; afterwards beneath this covering the real blastema is produced, affording the materials for the tissue which is to be formed, and undergoing the well-known changes to cells, tissue, &c. Well, then, if we examine microscopically what I have called the spurious exudation, we shall observe it to consist of amorphous, structureless masses; no cells are to be detected; it only seems to consist of molecules; no organization takes place. And even in these masses, by the addition of sulphuric acid, I have never observed the formation of sulphate-of-lime crystals, and consequently no phosphate of lime could be present. If, on the contrary, I examined in the same way the blastema produced beneath the spurious exudation, after the lapse of about twenty-four hours, I not only met with beautiful exudation-cells and pus-globules, but also, by adding a drop of sulphuric acid, could observe a rapid formation of crystals, so as to be led to the conclusion that the phosphate of lime is present in a large quantity, where cells are produced, and that it is wanting where we find nothing but amorphous masses. Lastly, with respect to this point, I have to draw the attention to the muscular tissue itself; and it will become evident, from my observations, how small a quantity of phosphate of lime we are able to detect by the kind of examination alluded to. The muscular tissue is well known to contain a certain quantity of phosphate of lime; it was the result of Liebig's inquiries, that when the formation of muscular tissue from the constituents of the blood takes place, nearly the whole quantity of alkaline phosphates returns into the blood, and that at the same time a certain quantity of phosphate of lime becomes chemically fixed in the organs themselves. This quantity, then, however small it may be in a muscular fibre, which is so fine, as, by microscopical examination, to show the transverse stripes, I have detected, in the above-described way, in a few muscular fibres which I had submitted to the action of sulphuric acid for about twenty-four hours. I observed, after this time, by the microscope, crystals of sulphate of lime—of course only in very small quantity, but beautifully formed. Especially in this kind of preparation the different stages of crystal-formation are to be well observed.

After these experiences, the other question remained—whether the phosphate of lime really influences and increases the produce of cells? I have tried to solve this question in a double way, first by experiments, and, on the other hand, by practical inquiry.

With respect to the experiments, it is my firm belief that I succeeded in artificially producing cells, which did not show any distinction from pus-globules and what we call exudation-cells. For this purpose I mixed together a part of the albumen of a hen-egg, some pure fat, a small quantity of phosphate of lime, and a very few drops of water; put the mixture, which was contained in an evaporating-dish, into a hot sand-bath, at a temperature of 104° F., and then microscopically examined

the changes which took place in the mixture itself. After the lapse of from four to six hours, I observed that an accumulation of albumen and phosphate had already taken place around the fat-globules; and after another period, equally long, I found those forms of cells which I have figured in the first plate of the paper alluded to. In another preparation I distinctly observed the gradual process of the formation itself by the simultaneous appearance of all the stages of formation of cells. Considering as the first stage the pure fat-globules, I observed, as the second, fat-globules, which presented a turbid appearance, in consequence of an accumulation of albumen and of phosphate of lime on their outside; and this accumulation, increasing more and more, produced cells, which, did not differ in their appearance from real exudation-cells. By the addition of sulphuric acid to these cells, I obtained the same results as by treating exudation-cells or pus-globules with it: there appeared on the outside of the cells very small and dark forms of crystals, which I considered to be crystals of sulphate of lime. I further observed some larger cells, which included a smaller one, so as to exhibit the appearance of what is called the "ovum primitivum," the observations and communications of which are communicated by Rud. Wagner in his splendid work, 'Prodromus Historiæ Generationis.' It appeared to me, that in these cases an accumulation of fat took place on a ready-formed cell, and that this fat-accumulation became surrounded again by the combined albumen and phosphate of lime. By the addition of acetic acid the cells became clearer, and dark molecules appeared on their surface.

Now with respect to the natural combination of the albumen of a hen-egg with a small quantity of phosphate of lime, I inquired whether the formation of cells should not take place by the mere addition of fat to it, and its continued exposure to a temperature of 104° F. I have instituted experiments with respect to this point; and I have found, that after the lapse of about eight hours some forms of cells could be detected, but their quantity was much smaller than in the above-described experiments—a result which was to have been expected, if the theoretical views upon which I founded my observations were correct. In conclusion, I have to state, that I obtained the same results by repeatedly performing the same experiments, and I only hope that they may soon be repeated by physiologists who are known to be authorities in this kind of observation.

With regard to the above-mentioned practical inquiries I equally obtained satisfactory results, which evidently showed that the phosphate of lime increases the formation of cells, supposing a sufficient quantity of albumen and fat to be present. I must refer to my former publications with respect to the individual cases; here I only beg to mention the general results.

First I tried the phosphate of lime in patients who suffered from chronic ulcers, resulting from the scrofulous diathesis, and exhibiting a want of formation of cells in the highest degree. These patients had been for a long time under medical treatment, inclusive of my own, but all remedies had been fruitless, such as cod-liver oil, ointments of lead and zinc, lotions of nitrate of silver, &c. Being myself quite sure, that no influence of the former kind of treatment could be still remaining in operation, and even after having left off all treatment for a long time, I

then ordered the phosphate of lime to about four or eight, to twenty grains per diem, and after a few days the ulcers evidently showed themselves in another state. The suppuration improved; instead of an ichorous secretion, a pus bonum et laudabile was produced, and after a few days longer the cicatrization begun. In children, in particular, I obtained very striking results, and there was not the least doubt, that the effect must be ascribed to the phosphate of lime. Generally I ordered it to be taken with the breakfast, dinner, and supper, in order to have it mixed as well as possible with the food taken; it is certain, that the phosphate of lime easily dissolves in albuminous solutions as well as in mineral acids, and in the acid of the stomach. But I have especially to mention, that in several cases, some time after leaving off the use of the phosphate of lime, I observed a fresh outbreak of the ulcers, for the real cause of which circumstance I could scarcely account at the time; I only supposed that the bad living of the patients, the food exclusively consisting of potatoes and bread, the abode in a damp unhealthy air, &c., caused the continuance of the general dyscrasia, and the repeated breaking out of the local affection. I am able now to account for it better than I could before, and with respect to this point, I must refer to the following parts of these communications.

As most of these ulcers occurred in patients afflicted with scrofula, the question arose, whether the phosphate of lime really cured the scrofulous dyscrasia, or only a part of it. With regard to this point, from many observations, the number of which has much increased since, it resulted that there exists an undoubted intimate relation between scrofula and want of phosphate of lime, but that we are not able to cure the dyscrasia by the mere use of the phosphate. The same is the case with tuberculosis, a disease which is well known to be intimately related to, if not identical with, scrofula. In both kinds of disease, however, we shall promote the cure in the most efficient manner by the administration of the phosphate of lime, and I cannot forbear recommending its use as much as possible. In the following pages I shall give the explanation of these facts, which I hope will at once prove, that the effect of the phosphate ought to be such an one as I imagined and really found it to be. I have especially to mention, that the waste of tissues, or, in other words, the want of formation of cells, was apparently less in many cases of tuberculosis and scrofula, which were treated with phosphate of lime, besides other remedies, than in those which were treated without the phosphate; that the cure of tuberculous ulcers of the intestines was evidently promoted and even effected by the administration of the phosphate, and this remedy proved most efficient in cases of incipient acute tuberculosis, and even those which are well known to manifest at their commencement nearly all the symptoms of typhus. I need not enter here more deeply upon the special effects of the administration of the phosphate in these cases, if the one general fact is always kept in mind, that it increases the formation of cells, or prevents the rapid and fearful waste of tissues.

In accordance with those facts, the phosphate of lime proved most beneficial in children who suffered from scrofula, diarrhœa, ulcerations and excoriations of the skin and the bowels, general waste of the cellular

tissue, loss of power, &c. In these cases, the mere use of six to ten grains per diem was often quite sufficient to effect the cure, and I have met with such striking and satisfactory results, as to leave no doubt that the want of the phosphate of lime was the real cause of the symptoms alluded to. These results, too, are confirmed by many physiological observations. Chossat, for instance, observed that pigeons, in consequence of an artificial want of phosphate of lime in their food, became afflicted with diarrhœa and softening of the bones; children, in the period of dentition, or when afflicted with rickets, which disease positively shows a want of phosphate of lime, are especially well known to suffer from diarrhœa, sores, &c. Still I have to mention the interesting observation, that in patients who were afflicted with diseases, in which the phosphate of lime proved beneficial, and who consequently were supposed to suffer from a want of phosphate of lime in their economy, wounds of occasionally applied blisters healed much more slowly than was the case in other patients, and the more so the more distinctly those symptoms appeared which should be referred to a want of phosphate of lime.

In syphilis I also tried the phosphate of lime, and even in persons who had for a long time already suffered from secondary ulcers, ulcers of the bones, &c., and became emaciated and extremely weak during that time. These cases likewise showed a most beneficial effect of the phosphate on the formation of cells. It ought to be mentioned, that besides the phosphates, the iodide of mercury was administered, but I have never met with such a rapid cicatrization of syphilitic ulcers, as was the case in these persons, and I could not help thinking that the cure was promoted in a remarkable degree by the internal exhibition of the phosphate. With respect to this point, I have drawn attention to the relation between scrofula and syphilis, and I think there are many symptoms in both of these diseases, and many facts besides, which evidently show an intimate relationship between them, and require a more accurate study than has been given to them hitherto.

As to other affections, in which I have tried the phosphate of lime, I have to mention rickets, caries, inflammations, and consecutive abundant suppurations of the cellular tissue, and also fractures of the bones. In all these cases, the administration proved most beneficial, and I would strongly advocate its further experimental use. With respect to fractures of the bones, I have to state in particular, that the consolidation of the callus took place in a much shorter period than is generally the case; however, too large doses of phosphate of lime must be shunned in these cases, as I have observed an abundant callus, causing a deformity of the bones, produced by the daily administration of twenty-four grains of the phosphate for a fortnight.

With regard to the fact that phosphoric acid is always produced in the economy by the changes of albuminous substances, and supposing that this phosphoric acid might combine with the lime, if carbonate of lime has been given, I tried also the carbonate; but the results of its administration were not so favourable as those which followed the administration of the phosphate, unless in some cases where the urine presented a high degree of acidity. This even was the case in many children afflicted with scrofula, and it must be decided by future experi-

ments, whether the carbonate of lime is preferable to the phosphate in these patients.

[Having stated the principal facts, affording a proof of the relation of the phosphate of lime to the formation of cells, Dr. Beneke proceeds to add, that as the formation of cells is increased by the administration of the phosphate of lime, we may ask—in the diseases shown to be most beneficially influenced by the administration of phosphate of lime—is the phosphate present in the system in a smaller quantity than it ought to be in the normal state? But it is impossible to determine directly the phosphate of lime which is present in the body. One might suppose the question might be solved by making accurate analyses of the blood, but]

We cannot avail ourselves of the analysis of the blood in order to solve the above question: but there is another way which will enable us to do so, and this way is afforded by continued analyses of the urine and the fæces. Thereby we shall know what quantity of phosphates is thrown out of the system, and by comparing this quantity with the average quantity of phosphates taken with the food, we shall be very well enabled to judge of a general increase or decrease of the earthy phosphates in the system. However, as it is very likely that the greatest part of the phosphates contained in the excretions of the bowels originate directly from the ingesta, and as it is certain, on the contrary, that the greatest part of the earthy phosphates contained in the urine originate from the wear and tear of the tissues and bones of the system, I have in the first place only directed my attention to the latter, and I have found the analyses of the urine to give a satisfactory answer to the question proposed. It is clear that if in the normal state from six to eight grains of phosphate of lime are eliminated from the economy in twenty-four hours, an elimination of from thirty to forty grains must indicate a general loss of bony substance; and from the quantities of phosphate of lime found in the urine, we may approximatively determine whether such a loss takes place or not. I do not myself consider the analyses of the urine alone sufficient for a complete solution of the above question; such a solution absolutely requires also analyses of the fæces and ingesta; however, it will be seen that, to begin with, those analyses of the urine are sufficient, and that they indicate the way which we have to apply to in our future inquires. Thus, then, instead of the above question, the question that arises is, whether in those diseases which I have shown to be most beneficially influenced by the administration of phosphate of lime, the earthy phosphates are eliminated from the system by the urine in a larger quantity than in the normal state? whether different quantities of phosphates are excreted in different diseases generally? and what quantities these are?

I am happy to state that I have succeeded in answering this question satisfactorily; and it really afforded me great pleasure to see the results of the analyses of the urine agreeing in the most remarkable manner with my former observations. I have found that in all chronic diseases which are distinguished by wasting, emaciation, ulcerations of the skin and of the bowels, &c., (such as scrofula, especially rickets, &c.,) a much

larger quantity of phosphates is removed from the economy by the urine, than ought to be in the normal state; and even such quantities as one would never have imagined, without entering into these examinations.

Previously, however, I have to say a few words on the mode of examining the urine which I adopted. As in other examinations of this kind, I here also only endeavoured to obtain approximate results, which I believe to be sufficient for general deductions. It seems to me quite indifferent, indeed, whether we know that a man's urine which is passed during twenty-four hours, contains ten grains or whether it contains eleven grains of phosphates; if our mode of analysis is sufficient to show whether a given quantity of urine contains ten, fifteen, twenty, thirty, fifty, or more grains of phosphates, I think this mode affords a way by which we may arrive at positive results. First, I believe it ought to be our only object to obtain such general and positive facts, upon which we can base our physiological and pathological views; and having become acquainted with these positive general facts, we may enter upon their more accurate examination, though in many cases we shall hardly gain anything else thereby, than a quantity of numbers, more positive and accurate than could be obtained in the other way; we shall gain other numbers but no other views. In this way I then proceeded with respect to the phosphates of the urine; and the following was the mode of examination which I employed.

It is well known that the phosphates of lime, as well as of magnesia, are held in solution in the urine by its acidity, and directly precipitate when the urine becomes alkalescent by the addition of alkalies, or ammoniacal by putrescence. This precipitation of the phosphates becomes much more complete when the urine is heated or boiled, and by the addition of a solution of soda to boiling urine we may precipitate the whole quantity of phosphates present. Supposing now we put a small quantity of urine (about two drachms) into a test-tube, boil it, and add a few drops of a solution of pure carbonate of soda, so as to make the urine alkalescent, and directly we shall perceive whether a small or a large quantity of phosphates is present. By always making use of the same solution of soda (I used a solution of one ounce of dry carbonate of soda in twelve ounces of distilled water), and of the same sort of test-tubes, we shall farther observe, that by the precipitation of the phosphates, certain and distinct degrees of turbidity are produced in this way in different sorts of urine, and even these degrees are so well marked, and so easily distinguished one from another, that I have considered this way sufficient in order to judge of the quantity of phosphates present in any urine. I therefore marked these various degrees of turbidity by numbers, and so exhibited for myself seven various types, on which I founded my observations. By No. 0, I marked a sort of urine which did not show the least turbidity by the addition of soda when boiled; by No. $\frac{1}{2}$ a sort which became opalescent by the same means; by No. 1, a sort of urine which became opalescent in a higher degree, but so as still to admit of the recognition of objects behind the test-tube, as, for instance, the bars of the window, &c.; by No. $1\frac{1}{2}$ a sort which exhibited an opalescence of such a degree that it was impossible to see through it, or to recognise any object behind it; by No. 2, a sort which became quite tur-

bid by the addition of soda, when boiled; by No. $2\frac{1}{2}$, a sort from which, after a few seconds, proceeded a precipitation of phosphates, when treated in the same way; by No. 3, a sort which directly yielded a precipitation by the addition of soda; and lastly, by No. 4, a sort of urine from which the greatest possible amount of phosphates was precipitated. These numbers, and these significations of them, soon became so familiar to me, that by several most accurate analyses, which I instituted in order to have a test of accuracy, I almost always obtained equal results, so as to convince me that this mode of analysis was to be relied upon.

Of course there occurred descriptions of urine which could not with propriety be marked by any of the numbers alluded to; well then, I marked them by $\frac{3}{4}$, $1\frac{1}{4}$, $1\frac{3}{4}$, &c.

In order to know the positive quantity of phosphates which was contained in the different sorts of urine, I made most accurate analyses of each of them, and these analyses the more increased my confidence, as they showed quite similar results to the numbers proposed.

When meeting with alkaline or ammoniacal urine, of course, after having well stirred it up, so that the sediment, if there be any, should be equally distributed throughout the whole, I first tried the degree of alkalescence, and according to this degree I added a few drops of soda-solution or none; and when meeting with albuminous urine, I first precipitated the albumen or boiled the urine, after the addition of the solution of soda, in which case the albumen does not coagulate. The eye may often prove fallacious; however, I could never deviate far from the truth, and the error committed could never surmount the quantity of phosphates which I marked by $\frac{1}{4}$, or at the most, $\frac{1}{2}$.

In accurately determining the quantity of phosphates present in any of the numbered types, I used the following method :—Four ounces of urine are made ammoniacal by the addition of a few drops of ammonia; the precipitation thereby produced is redissolved by acetic acid, and then a sufficient quantity of a solution of oxalate of potash is added; a precipitation of oxalate lime takes place, and this having subsided, after about twenty-four hours the urine is filtered. Thereby a residue of oxalate of lime and a filtered fluid is obtained. The oxalate of lime is then burned with the filter, and carbonate of lime results. Now, on gently removing the lid of the crucible, a few drops (3 to 5) of concentrated sulphuric acid are added; the acid is evaporated at about 200°, and then the sulphate of lime is strongly burned. The resulting weight of sulphate of lime multiplied by 0·7647 gives the accurate amount of phosphate of lime, the weight of the filter-ash having been previously deducted. To the filtered urine is then added a few drops of ammonia, and a precipitate results which consists of phosphate of ammonia and magnesia (triple phosphate.) After a few hours this precipitation is collected on a filter, and the residue, burnt with the filter and weighed, indicates the exact quantity of pyrophosphate of magnesia, the weight of the filter-ash having been here also previously subtracted. By summing up the quantity of phosphate of lime and of phosphate of magnesia, we shall obtain the exact quantity of earthy phosphates which is contained in four ounces of urine, from which may be easily calculated the quantity contained in one ounce, or in 1000 parts of urine. (This method of

analysis has been investigated by Dr. Heintz, at Berlin, and kindly communicated to me by Dr. Boecker.)

The following now are the result of the analyses which I have performed in this way, and which we may depend upon the more as most of them have been twice repeated. First, the urine which I marked by 0, always contains a very small quantity of phosphates; this quantity, however, cannot be detected in the above-described way, but it never seems to exceed the quantity of 0·2000 grains in one ounce of urine. There are many steps between no phosphates at all and of 0·2000 grains; they require a more accurate study in order to show the preternatural decrease of the quantity of earthy phosphates in the urine. But as we shall consider here only the hypernormal increase in the quantity of phosphates which are excreted in the urine in diseases, I am compelled to waive this discussion at present. I have only to state that in every case we may consider a urine marked by 0, as containing 0·2000 grains of earthy phosphates, or less; never more than this in one ounce. With respect to the other descriptions of urine, I should really far exceed the limits of this paper by adducing the results of the single analyses; they can be seen in a pamphlet which I have lately published in Germany, entitled, 'Zur Physiologie und Pathologie des Phosphorsauron und Oxalsauron Kalkes,' Goettingen, 1850. Here I only beg to state the general results as follows:—

A urine, marked by ½, contained nearly 0·250—0·300 grains of earthy phosphates in one ounce; a urine marked by 1, 0·400—0·450 grains; a urine marked by 1½, 0·550—0·600 grains; a urine marked by 2, 0·700—0·750 grains; a urine marked by 3, 1·000—1·050 grains; and lastly, a urine marked by 3—4, 1·000—1·3000 and more grains of earthy phosphates. By referring to these numbers we may easily approximatively calculate the quantity of earthy phosphates voided in twenty-four hours, and I am sure we shall never be far from the truth.

After these explanations I have to speak of the different quantities of phosphates which I met with in the urine in different diseases. My observations of course do not extend to all diseases; it would scarcely be possible to give such accounts in a large number of years, notwithstanding I observed a sufficient number of cases with respect to this point for the deduction of some general results.

First, I have to remark generally, that scarcely any disease occurs, in the course of which we should not sometimes find an increased quantity of phosphates; that at any rate there exists no disease which does not admit of some hypernormal excretion of phosphates at some one of its periods; on the other hand, we meet at different periods of disease with quite different quantities of phosphates, as, for instance, it often happens that in the first stages of diseases we do not find an increased quantity of phosphates at all, and that at a later period a large quantity is excreted. With respect to this point, and in order to obtain results which can be depended upon, it is therefore indispensably necessary to examine the amount of phosphates almost every day; we shall never arrive at correct views if we do not attend to this rule.

Secondly, it must be stated as a general result, that the quantity of phosphates excreted does not depend as well upon the nature of the dis-

ease itself, as upon the individual afflicted; and if in one case of rheumatism we find, for instance, a large amount of phosphates in the urine, we do not detect any increase at all, perhaps, in another case. This point really is a very important one; it affords the best proof of the general fact, that we are always wrong in speaking of certain diseases as of individuals, or as of well defined and marked never-varying alterations of the physiological state of the body, and that we shall never succeed in obtaining positive results, if we do not direct the most accurate attention to the previous history and the former state of the individual who has become afflicted with any disease—in other words, if we do not individualize disease.

It may be concluded from these short remarks, that it is very difficult to give an account of the excretion of phosphates, generally applicable and absolutely right in almost every case. However, we meet with some pathological states which, generally speaking, very rarely show an increase of the excretion of phosphates; with other affections which always show an increased quantity of phosphates in the urine and even a most anomalous quantity; and with others which are generally distinguished by a slighter, but continued loss of phosphates. To these states and affections I shall now draw attention, and I scarcely know how to give a better explanation of them, than by referring to the numbers above alluded to.

I have met then with urine containing only such a quantity of phosphates as I have marked by 0 or ½—

1st. In persons who, always showing a good state of health, a normal complexion and colour, and a strong constitution, have accidentally become afflicted with disease or injury, as, for instance, with syphilis, wounds, contusions, &c. As I really considered these persons as nearly healthy, at least for so long a time as the affection remained a local one, I am inclined to view the quantity of 0·1000—0·2000 grains of earthy phosphates in one ounce of urine as nearly the normal quantity. It must, however, be remembered, that it is always extremely difficult to speak of normal states of health, a precise distinction between health and disease being incompatible with our present amount of knowledge, if conceivable at all.

2nd. In the first stages of acute diseases, as, for instance, of acute rheumatism, pneumonia, pleuritis, peritonitis, &c. When these diseases happened in persons who did not exhibit any other signs of diseased constitution, and had never been ill before, I did not, either during the whole course of the disease nor upon recovery, find an increased quantity of phosphates in the urine. But it was seldom I met with such persons. When, on the other hand, persons were afflicted with acute diseases who never enjoyed good health before, or suffered from dyscrasia of the blood, I almost always met with an abnormal quantity of phosphates in the urine after the acute stage having ceased; there appeared now all the symptoms of the original dyscrasia, and either the reconvalescence was a very slow one, or emaciation, general weakness, &c., was still increasing; instead of acute tuberculosis, the symptoms of chronic affection of the lungs appeared; instead of acute rheumatism, chronic rheumatism remained. From these very remarkable differences

I concluded with certainty, that it was not the disease itself which caused a decrease of the excretion of phosphates, but that this decrease was exclusively dependent upon the acuteness of symptoms, that is to say, the feverish action—a circumstance which I shall refer to in the following parts of this paper. It must also be mentioned, that in some cases of acute disease I met with a quantity of phosphates, as marked by $\frac{3}{4}$ or 1, even during the first periods; in these cases, however, the quantity of phosphates was very considerable after the acute symptoms having ceased.

3rd. In the first stage of typhus fever. Here I always met with a decrease of the quantity of earthy phosphates in the urine, a result which, after a great many analyses, seems to be a characteristic one. With respect to the later periods of typhus, however, the same refers to them as I have stated on acute diseases generally.

4th. In some cases of Bright's disease, as well as in some persons who suffered from stenosis of the orifices of the heart, or from insufficiency of their valvules. But some cases also occurred where an absolute increase of phosphates was met with; however, in these cases complications or affections of other organs could be observed; and I am inclined to suppose that the dyscrasia of the blood, which leads to the well known degeneration of the kidneys, as well as the dyscrasia which results from the above-mentioned diseases of the heart, does not cause by itself any increase of the earthy phosphates in the urine.

5th. In the first stages of carcinoma, (but only in these); an observation the more interesting, that Rokitansky alludes to the preternatural development of the bones, or the proportion of phosphate of lime in persons afflicted with cancer. I myself, found in a post-mortem examination of an individual who died from carcinoma of the lungs, all the cartilages of the ribs ossified; which was never the case in persons who during life passed for a long time increased quantities of phosphates, and had been afflicted, for instance, with tuberculosis.

I have to add generally, that in all cases where I observed no increase of the phosphates in the urine during *the whole course* of a disease, I likewise never observed emaciation; that is, want of formation of cells; these persons altogether were of strong constitution and showed a remarkable development of the muscles. In these persons blistered surfaces healed far more speedily than was the case in persons who passed a hypernormal quantity of phosphates, the average time being three or four days. Of course in acute diseases emaciation was observed though no abnormal loss of phosphates could be detected; the same was the case with Bright's disease. In these affections, however, many circumstances concur, which sufficiently account for the waste of tissues—circumstances which do not require any further explanation.

With respect to the quantities of phosphates which I marked by $\frac{1}{2}$, 1, $1\frac{1}{2}$, and even 2, I found them to be present in very different and nearly all sorts of diseases, varying on different days in one case, and always remaining of nearly the same amount in others. These cases proved in a most remarkable manner that it is not the disease itself which causes the excretion of phosphates, but that there must necessarily exist some other cause in the economy, to account for the excretion alluded to. I

observed the mentioned quantity of phosphates, that is to say, from about 0·350 to 0·700 grains in one ounce of urine, in chronic rheumatism of the joints or muscles, in the chronic stage of tuberculosis, in the ulcerative stage of carcinoma, in different sorts of chronic diseases of the skin, such as eczema, impetigo, ecthyma, and boils, slight cases of scrofula, syphilis, emphysema of the lungs, and especially in cases of chronic dyspepsia, hemorrhoids, &c. It is impossible to give any special account of the quantities observed, unless I give a special explanation of every case, an explanation which would too far exceed the extent of these papers; moreover, I shall speak about the cause of the excretion of phosphates in the following part of this communication, and we shall become acquainted thereby with those circumstances on which the excretion of the different quantities in different diseases depends; but I have to state that the general complexion of patients in these cases rarely surpassed what we call the middle degree, and often even did not surpass an emaciated, feeble state of health; these patients do not get fat or muscular, in spite of large quantities of wholesome food; on the contrary, the more they take, the less they gain strength and power; indeed, as long as the excretion of phosphates is abnormally increased, the formation of cells is impaired.

Thirdly, I have to speak of diseases in which I met with the largest quantities of phosphates, such as marked 2, 2½, 3, and 4. These quantities have been found:—

1st. In scrofula and rickets. Especially in children afflicted with scrofula and ulcers, or other diseases of the skin, as impetigo, boils, &c. with diarrhœa and atrophy, I found large quantities of phosphates passed by the urine; in one case of inflammation in the knee-joint, in a young man who was afflicted with scrofula, the quantity of earthy phosphates passed amounted to nearly a drachm every day.

2nd. In tuberculosis, especially in those stages where the very acute state and deposition of tubercles in any organ has ceased, a slight fever, however, and the dyscrasia of the blood continues. I did not observe any increased quantity of phosphates during the first attacks of acute tuberculosis, exhibiting the well known symptoms of typhus; but as soon as the localization had taken place and an exudation in the lungs was produced, the general symptoms decreasing in acuteness, the phosphates appeared in the urine in an increased proportion, and soon amounted to 0·8, 0·9, or even one grain in one ounce of urine. This being the case, I was rather puzzled at not finding any increase of phosphates during the very last days of some persons dying of tuberculosis. But also this point I shall account for in the following part of this paper.

3rd. In such cases of acute rheumatism which occur in anemic individuals, and are well known to be accompanied by a remarkable loss of flesh, or by a want of formation of cells. I have mentioned already, that in the acute stages of these cases, I met with no increased proportion of phosphates at all; but as soon as the acute stage was over, the phosphates appeared, and then rapidly increased to nearly the same amount as I observed it in tuberculosis.

4th. In the last stages of carcinomatous and some other affections, yielding large quantities of pus or ichorous secretions, such as psoas

abscess, suppuration of the cellular tissue, &c. In these very cases, the general emaciation of the patients was very remarkable, although readily accounted for, if we take into consideration, that for the formation of cells three substances are required—namely, albumen, fat, and phosphate of lime, and that two of these were evidently excreted from the economy in an immense quantity; on the one hand, by the suppuration; by the urine on the other. However I also met with some rare cases in which a remarkable emaciation took place, in consequence of abundant suppurations, without a remarkable increase of the phosphates having been observed. But these cases could scarcely afford any objection to my other results, the suppuration being so large as sufficiently to account for the emaciation itself. It is self-evident, that in all cases where emaciation takes place, we must not only look at the quantity of phosphates eliminated from the economy, but likewise at the quantity of albuminous and fatty substances which have been taken as food during the course of the affection, which are present at its commencement, and which are eliminated in the form of pus, serous exudations, urea, &c.

With respect to the other cases referred to, it must also be generally stated, that in almost every case the emaciation was a very rapid one during the excretion of large quantities of phosphates, and sores of blisters applied to these individuals scarcely healed at all, or at least not till after a long time. We may provide persons who are afflicted with these diseases with the largest quantities of albumen and fat, but we never shall produce thereby a remarkable increase of tissues or complexion—that is to say, of formation of cells, if we do not diminish at once the excretion of the phosphates by the urine. The disease will not cease as long as their excretion continues, but if a decrease of the phosphates in the urine takes place in an early stage of the affection, we may be induced thereby to believe that the condition is really an improving one. On the other hand, it should be remarked that the nature of the diseases alluded to is a very different one; that, therefore, the hypernormal excretion of phosphates is also here independent of the disease itself, and that there must exist some other cause of it, the investigation of which will be the subject of the following part of this paper.

These are the chief points which I have to refer to, with respect to the different quantities of phosphates excreted from the economy in different diseases. The general conclusions are, that a hypernormal excretion of earthy phosphates by the urine is independent of the nature of the disease; that wherever we observe such an excretion, we find a corresponding deficiency of formation of cells, emaciation and loss of strength; but that, finally, this deficiency of formation of cells, is not always exclusively caused by a hypernormal loss of phosphates; that, on the contrary, it is often only the result of fever, of suppuration, of want of nourishment, or of any other loss of materials necessary for the regeneration of tissues and organs.

There is one point more, which I have to direct attention to It having been well known for a long time, and more accurately established by the inquiries of Dr. Bence Jones, that the quality and quantity of the urine are very different at different times of the day, I also examined the quantities of phosphates voided at different periods in the twenty-

four hours. It is not here the place to explain, that by repeating the very interesting examinations of the urine, published by Dr. Bence Jones in the 'Philosophical Transactions' Part II., 1849, p. 235, I did not obtain quite the same results as this able physician, respecting the decrease and increase of the acidity of the urine; I only have to remark with respect to the phosphates, that this quantity also is very varying at different periods of the twenty-four hours. But from a great many analyses of this kind, I could not detect any certain regularity in the excretion of the phosphates; it may only be stated that generally in persons who are known to pass hypernormal quantities of earthy phosphates during twenty-four hours, in one sort of urine, out of three or four sorts passed after dinner, we find the largest quantities of phosphates; and that likewise generally one specimen of urine, out of three passed in the morning, contains a large quantity of them; the other ones showing either a decrease from, or an increase to, the highest amounts, or no hypernormal excretion at all. This being a fact, we shall never be able to judge of the quantity of earthy phosphates present in one ounce of urine of any person, unless we examine the whole quantity which is passed during the twenty-four hours. A quantity of urine, passed at a certain time of the day and examined with reference to the phosphates, will always lead to wrong conclusions respecting the whole quantity of phosphates excreted during twenty-four hours. I have carefully attended to this circumstance in my observations, so as to make them trustworthy in this respect; it should never be neglected by others entering upon similar investigations.

To sum up now the results of the first and second part of these communications, I have shown in the first that, supposing a sufficient quantity of albumen and fat to be present, the produce of cells evidently increases by the administration of phosphate of lime; that, on the other hand, by this administration we may promote the cure of diseases which show a deficiency of formation of cells; and that especially in scrofulous affections the administration of phosphate of lime has often proved most beneficial. On the other hand, in the second part, I have established the fact, that in nearly all chronic diseases, where we observe a loss of flesh, emaciation, and general weakness, a hypernormal quantity of phosphates is always excreted from the economy by the urine, and more especially in those cases where the administration of phosphate of lime proved most beneficial. Perhaps it might be supposed that these quantities had been increased by the phosphate of lime taken as a remedy; but this is by no means the case; on the contrary, my observations prove that, even during the administration of phosphate of lime, the quantity of earthy phosphates in the urine often decreases, supposing a proper treatment in other respects to be employed. Well, then, the harmony of the results of the above two parts is so striking, that we can scarcely admit of any doubt in their truth, and the physiological as well as pathological importance of the points alluded to is so apparent, that it does not require any further explanation. We know that the phosphate of lime is indispensably necessary for the production of cells; we know that in a great many diseases the phosphates are excreted from the economy in very abundant quantities by the urine; and we know

even that in these diseases the formation of cells is deficient. Shall we have any doubt that by substituting the quantity of phosphates excreted by the urine, or by removing the cause of their excretion itself, we must afford a great benefit to persons who are afflicted with the diseases alluded to.

There remains one difficult point, which I have to refer to. In the way which I relied upon in determining the quantities of phosphates in the urine, I precipitated the phosphate of magnesia, as well as the phosphate of lime. This having been shown microscopically and chemically, the question arose, whether the results which I spoke of with respect to the phosphate of lime would not require an amendment? It is true the proportions between the phosphate of lime and phosphate of magnesia are very different in different urines; however, I rarely observed the quantity of magnesia to exceed the quantity of lime; on the contrary, it was oftener found less. I therefore concede, without any hesitation, that the exact quantity of phosphate of lime could not be ascertained in the manner which I have adopted; but generally we shall not be far from the truth in supposing half the quantity of earthy phosphates present to consist of phosphate of lime, this being generally below and very rarely beyond the real quantity. I must repeat with respect to this point the above-given remark, that I have only looked for approximative results, and that I believe them sufficient for the conclusions which I have drawn. All these relations demand a very accurate revision; nor can I refrain observing that the proportions between phosphate of lime and phosphate of magnesia in different diseased persons are highly interesting, so much so as to recommend their most accurate study and exact analysis. In expressing this opinion, I refer, for instance, to a communication in the 'Annales de Chimie et de Physique, Juin, 1849, tom. xxvi.,' 3e série, entitled, 'Recherches sur les Causes du Goître et du Cretinisme, par M. T. Grange;' but I am compelled to waive the discussion for the present, it being rich enough in itself to form the subject of a special treatise.—*Lancet, April* 19, *June* 21, *and June* 28, 1851, *pp.* 434, 668, 699.

153.—ON THE BLOOD, IN ITS RELATION TO THE EXCRETIONS.

By Dr. H. Bence Jones, F.R.S., &c.

One of the most interesting substances, and certainly the most important one, is carbonic acid, which passes out by respiration. By a very easy and beautiful experiment I can show you its presence in the blood. I have here an apparatus which will produce hydrogen. I have a tube full of caustic potash, which will stop any trace of carbonic acid which can possibly exist. Sulphuric acid is made to act upon zinc so as to produce hydrogen; this hydrogen passes through the solution of caustic potash; it then passes into another vessel, into which, when filled with the hydrogen, some healthy blood is put; the hydrogen bubbling through this, passes through some lime-water in other vessels; and

if it carries with it any carbonic acid, the lime-water will of course become turbid. You see how rapidly this turbidity is produced. Carbonic acid, then, is a substance which exists in the blood, and is passing out each moment by respiration. The proportion of carbonic acid to oxygen, in arterial blood, is as 16 of the former to six of the latter; and, in venous blood, 16 carbonic acid to 4 oxygen. This proportion was determined for us by the German chemist, Magnus. He found that the quantity of nitrogen was the same in both kinds of blood. M. Majendie states, that in venous blood, in every hundred volumes, there are seventy-eight volumes of carbonic acid gas, and in arterial blood 66 per cent.

Other substances can be obtained from the blood which are constantly passing out of the body in the urine. The most interesting of these are uric acid and urea, substances which form the peculiar characteristic constituents of the urine. These can be found in small quantities in healthy blood. I have here a beautiful specimen in long crystals of urea obtained from the healthy blood of an ox, for which I am indebted to M. Verdeil. It is obtained by drying the serum of the blood, reducing it to the finest powder, mixing it with alcohol, and then pouring off the alcoholic solution, which, in health, always contains small quantities of urea. In some diseases the quantity of urea in the blood is considerable—as for instance in Bright's disease. In this disease the blood-globules are exceedingly diminished—the albumen is constantly passing out in the urine; and it is always found that urea is one of the constituents of the serum. It may be obtained thus:—Here is the serum of a patient who was bled in St. George's Hospital Here is a portion evaporated to dryness; a part of this dry residue is treated with absolute alcohol, the alcoholic solution is evaporated in vacuo to dryness; and the dry residue is dissolved in a little water; on the addition of nitric acid, nitrate of urea, as you see, immediately crystallises.

Uric acid is also found in the blood in health and in disease, combined with soda. It was discovered by Dr. Garrod, of University College; he states that it exists in increased quantity in the blood of gouty subjects; and, from my own experiments, I can confirm the truth of his statement. Dr. Garrod also says, that he found in Bright's disease urate of soda in excess in the blood. In that disease the kidney is prevented from performing its proper functions; the ingredients of the urine are not separated as they should be, and thus urea and uric acid accumulate in the blood. Uric acid, like urea, can be easily detected, by taking the serum, or the blood as a whole, evaporating it to dryness, reducing it to the finest powder, and treating it with boiling water; urate of soda will thus be obtained in solution. The liquid is filtered off from the insoluble albumen, and the clear fluid is mixed with strong acetic acid, and set aside to crystallise. The uric acid adheres to the sides and bottom of the glass. It may be collected, and will give the characteristic reactions with nitric acid and ammonia.

Kreatin, which I formerly mentioned as one of the constituents of the flesh, probably exists in the blood. It exists certainly in the urine, as I shall have to show you. Hippuric acid, also, which exists in the urine, especially in graminiverous animals, has been found in the blood. It

was detected in the blood of an ox, by M. Verdeil. Lastly, Dr. Garrod also considers that he has found oxalic acid in the blood of a patient in University College Hospital.

Thus, then, there exist in the blood, not only the substances which pass into the body as food, but the substances which pass out in the excretions. I have said that the great peculiarity of the blood is, that it contains fibrin and the red globules; these substances cause the blood to differ from all other fluids. The spontaneous coagulation and the red colour are caused by the globules and the fibrin; neither of which exists ready formed in the food, nor are they ever found in the healthy excretions. If it were not for these substances, it might almost be said that the blood was nothing but a solution of food passing in, and of substances passing out of the body: it is then by the formation of the fibrin and blood-globules that the blood is made a peculiar substance,—an organized liquid, which may live and die like the more solid organs of which we are composed.—*Med. Times, August* 2, 1851, *p.* 115.

154.—ON THE THERAPEUTIC USES OF INDIAN HEMP.

By Dr. Alexander Christison.

[Indian hemp, in spite of the strenuous recommendations of Dr. O'Shaughnessy, has been but little used in this country hitherto.]

Dr. O'Shaughnessy used it in the following diseases:—In three cases of rheumatism he found it apparently beneficial. In one of these, it seemed to produce great insensibility, and a state resembling catalepsy; but on this state passing off, the man was found to be thoroughly restored to health. In an epidemic of cholera, it was thought serviceable; but although it seemed to stimulate the circulation, and check diarrhœa, it is doubtful whether any ultimate good resulted. In a case of hydrophobia, a soothing effect, with diminution of the spasms, and greater facility in drinking, was kept up for four days; but the patient died. Several cases of tetanus were also treated by him in this way, with apparent success. In one, ascribed to cauterization of the hand, by a quack mixture of incandescent charcoal and tobacco, a state of intoxication was excited by large doses of the extract of hemp, and the spasms were gradually put an end to; but death ensued in the end from mortification of the hand. Another patient consumed 134 grains of the extract, and was ultimately discharged from the hospital cured. A third case, with similar results, is detailed. At the Native Hospital at Calcutta, Mr. O'Brien treated seven cases of tetanus in this way, and in four of them he employed ten-grain doses. The result was, almost immediate relaxation of the muscles, and interruption of the convulsive tendency. Four of these cases recovered. A case in the practice of Mr. Richard O'Shaughnessy is also detailed, where the disease was connected with suppurating wounds of the scrotum. The hemp had no effect for four days, and then the patient became tranquil, with fewer paroxysms, and the appetite good. When the hemp was intermitted, the symptoms became aggravated; latterly, the hemp caused much

excitement, and was therefore discontinued. The last case is one of infantile convulsions, where very large doses were given, and where the narcotic action greatly relieved the symptoms. The child recovered. This gentleman is confident that the resin is capable of arresting the progress of tetanus, and that, in a large proportion of cases, it will cure the disease.

It would certainly appear from the above facts, that Indian hemp has proved of service in the treatment of tetanus, as it occurs in India. How far this result has been obtained in Europe, I shall now describe.

That I may not extend my observations to too great a length, I shall limit my remarks to the treatment of tetanus, as observed in cases in private practice, and in the Edinburgh Royal Infirmary.

Professor Miller has provided me with the following remarks: —

"My own experience speaks loudly in favour of the hemp. I can now record three fortunate cases under its use—all traumatic tetanus—and a case which proved fatal, but where great alleviation of suffering was produced.

"The first of these was a girl, aged seven, admitted to the Royal Infirmary, October 18, 1844. She had received an extensive injury of the middle finger of the right hand a fortnight previously. Inflammatory swelling and pain became intense, and there was a tendency to spasmodic flexion of the fingers and wrist. On the 23rd she was observed by the nurse to take a 'kind of fit,' becoming rigid, having difficulty in opening the mouth and in swallowing, and complaining of pain in the jaws. At visit, she seemed perfectly well. A brisk purge was ordered, and, lest the case should prove tetanus, ten drops of tincture of hemp were prescribed to be taken every four hours. Next day the symptoms were well marked, without any influence from the hemp. The finger was then removed, and the simplest dressing applied to the wound. The dose of hemp was increased to 20 drops, and after five doses, she slept; but the following day the symptoms were aggravated. Turpentine enema was ordered, and ice to the spine—30 drops of cannabis to be given hourly. In the evening there was rigidity, but no spasm; the hemp to be given every half-hour; after which she became drowsy, and at 12 next day she was much improved. Aconite was now substituted; but as the spasmodic attacks became more severe, hemp was again given, with the effect of producing sleep. She continued to improve till the 25th November, the dose of hemp being gradually reduced; producing, when given, drowsiness, or calm sleep; it was soon discontinued, as it then seemed to excite the circulation. Throughout the whole period of its use, its effect on the appetite was most obvious, the craving for food being at times absolutely voracious. After this no more medicine was given, and recovery was complete.

"The second case, occurring in private practice, was that of a boy, about the same age, who had simple fracture of the thigh, with compound and comminuted fracture of the great toe. The treatment and result were the same.

"The third was a boy, rather older, who had compound fracture of the bones of the arm. Treatment again resulted in cure.

"In these cases a few doses generally induced sleep, with marked

mitigation of the spasms. The period of narcotism did not exceed two or three hours; the sleep was deep and unbroken, and seemed to be refreshing. It was followed by no headach, or other apparent inconvenience. The most remarkable effect observed, was the tolerance of the remedy, whereby a girl, aged seven, took every half hour, and sometimes many hours in succession, doses of hemp sufficient to narcotise an adult."

In these cases, Mr. Miller is inclined to give the hemp credit for a chief share in the cure.

In 1846 the virtues of hemp were tested in a case of tetanus in the Royal Infirmary, in the wards of Dr. Duncan. In 1847 another case presented itself, where hemp was administered. At that time sulphuric ether was much used as an anæsthetic, and it was thought probable that it would be of service in this case. The patient inhaled it at frequent intervals during a whole afternoon, with decided, but only temporary, relief. After this cannabis was given, without its physiological action being attained by nearly an ounce and a half of the tincture; it was not persevered with. Ether was again tried, and also opiates with some benefit. The patient died on the 13th day.

The first of these cases was very accurately observed, and the following report of the case from the journal will be found to have considerable interest:—

James Mackay, a railway labourer, was admitted under the care of Dr. Duncan, October 20th, 1846. He had received a slight lacerated wound of the hand a week before, and tetanus had commenced on his admission. The wound appeared to be healing. He complained of great general uneasiness, particularly about the neck and spine, of some rigidity of the jaws, which could only be separated three-quarters of an inch, of inability to protrude the tongue, and of commencing spasm of the neck and upper part of the back. He complained also of a "burning about the heart." His expression was anxious, with but little "risus." His thirst was great, but swallowing difficult. He perspired profusely. The spasms, of short duration, recurred once or twice every minute; pulse, 115 to 120, soft. Opening medicine was ordered, and at eleven o'clock tincture of hemp was given, repeated in doses of fifteen or twenty drops, with appreciable effect. On the 21st the bowels were not opened, though a turpentine enema was administered. The spasms were more violent and general, and a touch caused general spasm. He had not slept; 120 to 140 drops had no effect. The doses were increased to sixty or eighty drops every three-quarters of an hour, and croton oil was given, producing free action on the bowels; and in the evening the spasms abated, but the hemp caused only slight dozing at intervals. The tincture was ordered to be continued, and strong beef-tea to be drunk.

On the 22nd swallowing was easier, the spasms less violent, but not less frequent; 100 drops were given at half-past eleven, and continued about every half-hour till four o'clock, when drowsiness was quite decided; he was not readily roused, even by the spasms which, though as frequent, were not so intense. At nine o'clock drowsiness was passing off; copious stools, coloured as by the medicine, were brought away by injection; 130 drops were given, and repeated at midnight, at which

time he was much relieved, but suffered from cough. On the 23rd the spasms were again gaining strength, no hemp having been given for nine hours. A drachm of the tincture was given, and repeated at eleven, when he became quiet. The doses were continued till evening, when he took mince-collops and beef-tea without difficulty, and the bowels were copiously relieved.

On the 24th, at visit, the spasms were absent, but the chest symptoms were worse, with general mucous râle, and frothy sputa mixed with blood. Drowsiness had been kept up by doses of a drachm to a drachm and a half. In the evening he was much weaker, but quite sensible, with a desire for food. On the 25th he was perfectly free from spasm, but was evidently dying, from accumulation of mucus in the chest. Very little hemp was given. He died at eight p.m.

In this case six ounces of O'Shaughnessy's tincture of Indian hemp were given in all, being equal to 144 grains of the extract. The extract for the tincture was reputed the best in Edinburgh. The doses at first were evidently too small. The examination of the body was not permitted.

It is a safe conclusion, from these facts, that Indian hemp deserves further trial in the tetanus of Europe, as well as in that of hot climates. I would particularly urge, however, the necessity, in all such trials, of making certain, by experiment on healthy persons, that the preparation to be used is good. For the present there is no other satisfactory test of quality.

As to the use of hemp as a calmative and hypnotic in diseases in general, I may mention that, while acting as clinical clerk in the Royal Infirmary, in 1849, I had several opportunities of administering hemp in different diseases as a hypnotic. The object was in general attained, and no evil results followed. I regret there is no record of these cases, as at the time I did not pay particular attention to the subject. Hemp is frequently given in other wards of the Infirmary for a like purpose. In cases of phthisis and other lingering diseases, where opiates have for a long time been administered, but have ceased to produce sleep, Indian hemp may often be given with advantage; thus, in one case of advanced phthisis, doses of five to ten drops of the tincture were successful in procuring sleep when other means had failed.

Dr. Christison has administered hemp in many instances. He gives the following account of two of them:—

A gentleman had suffered from palpitation of the heart for twenty-one years, and at night the attacks were generally most severe. He had used one medicine after another with the hope of relief, but he did not derive any benefit. Dr. Christison advised him to try Indian hemp. The patient's wife states that he passed the night on taking it without suffering from the palpitation, though still he was perfectly conscious of its presence; and that the attack left him entirely at 8 a.m., instead of continuing twenty-four hours, as it previously did.

In the other case, a gentleman was afflicted with a severe eczema over the whole body, with intense itching. A large dose of solution of the muriate of morphia caused extreme sleepiness, but so much increased the itching that he was kept awake by the necessity of scratching.

Twenty-five drops of cannabis tincture gave him six hours' sleep, and he continued to enjoy sleep from four to six hours every night for six weeks, without increasing the dose, until the eruption was nearly removed; during all this time the itchiness continued as before when he was awake.

Dr. Christison has observed that, in the generality of cases, hemp has had the effect of causing sleep without disturbing the function of the stomach or bowels. Given where morphia and hyoscyamus had failed, it has also repeatedly failed to cause sleep; but in one or two cases he has found it to succeed where morphia and opium disagreed.

An interesting series of cases by Mr. Donovan will be found in the 'Dublin Journal of Medical and Chemical Science' for 1845. This gentleman was convinced of the beneficial effects of hemp, particularly in cases of neuralgia. Mr. Donovan had himself suffered occasionally since early life from neuralgic pain of different parts of the foot, lasting one or two days, or sometimes a week. Immersion in cold water gave entire relief, but no other treatment did so, till he took five drachms of weak tincture of hemp; in twenty minutes the pain was gone; at the same time, "he had hardly any consciousness of the motion of his limbs when walking—they appeared not to belong to him." On another occasion, he took six drachms without effect; but on the third night, after taking twelve grains of weak extract, he was free from pain, and slept four hours; and in several other attacks he derived similar benefit.

A gentleman was attacked on going to bed with excruciating pain in the left upper jaw, which kept him awake till morning; after a short sleep, he awoke in torture, and in the evening, upon taking his third dose of fifteen minims of weak tincture of hemp, he slept profoundly till eight next morning, when the pain was much abated. At night he repeated the remedy, with similar results, and next evening he took twenty minims, which deadened the pain; but it soon became as bad as ever. Embrocations of laudanum and camphor spirit were then tried, with another dose of twenty minims, and he immediately fell asleep; in the morning the pain was nearly gone, and it soon disappeared.

Another gentleman had excruciating sciatica for thirteen weeks; his sufferings caused groans, cries, and tears, and he passed sleepless nights. The only relief he obtained was from firm pressure on the hips, and, for a short time, from laudanum. Two doses of hemp, at short intervals, produced sound sleep for eight hours, and on awaking he was perfectly relieved. Five doses more so completely subdued the pain that it gave little farther trouble. He experienced a slight but transitory return on entering a cold room.

A number of other cases will be found in Mr. Donovan's paper, in which the hemp, if it did not effect a cure, yet was of great service in the treatment of the complaints to which he alludes; but in several cases no good followed, and, on the contrary, unpleasant effects were produced. Thus, a lady suffering from neuralgia of various parts of the body was ordered five drops of strong tincture at night; next morning she was giddy and weak, and, without authority, took five drops more. She became faint and universally cold, had some apprehension of death, and remained disagreeably affected during the whole day; the pain was not

relieved, and the effects of the hemp reappeared at intervals for two or three days.

Another patient, who was accustomed to take hemp, on one occasion had alarming depressing symptoms; he sat, greatly agitated, with his eyes open, and his head reclining on his chest. The respiration was tremulous, with interruptions of sobbing; his whole frame was in an indescribable shudder, and he seemed to shiver with cold. The pulse was good all the time, and in half an hour he recovered.

Indian hemp, in different forms has been recommended, principally by the older writers, for several other purposes, as in the treatment of diarrhœa, gonorrhœa, and locally as an anodyne lotion, or in the form of poultice for hemorrhoids. For these purposes, I am not aware that it is now used; but there is one affection where it has lately been applied with advantage—viz, uterine hemorrhage. Dr. Churchill says ("Diseases peculiar to Women," Ed., 1849)—"We possess two remedies for these excessive discharges, at the time of the menses going off, which were not known to Fothergill—ergot of rye, and tincture of Indian hemp. The former has been long known to possess the power of restraining uterine hemorrhage after delivery, &c., but the property of hemp of restraining uterine hemorrhage has only been known to the profession a year or two. It was accidentally discovered by my friend, Dr. Maguire, of Castleknock, and since then it has been extensively tried by different medical men in Dublin, and by myself with considerable success. The tincture of the resin is the most efficacious preparation, and it may be given in doses of from five to fifteen or twenty drops three times a-day, in water. Its effects, in many cases, are very marked, often instantaneous, but generally complete after three or four doses. In some few cases of ulceration, in which I have tried it on account of the hemorrhage, it seemed to be equally beneficial.

These effects seem to me to be allied to the action of hemp on uterine contraction during labour, to the consideration of which subject I shall next proceed.

[The following interesting cases are given by Dr. Christison of the powers of Indian hemp on the contractions of the uterus.]

One woman, in her first confinement, had forty minims of the tincture of cannabis one hour before the birth of the child. The os uteri was then the size of a shilling, the parts very tender, with indurations around the os uteri. The pains quickly became very strong, so much so as to burst the membranes, and project the liquor amnii to some distance, and soon the head was born. The uterus subsequently contracted well.

Another, in her first confinement, had one drachm of the tincture, when the os uteri was rigid, and of the size of a half-crown; from this the labour became very rapid.

Another, in her first confinement, had also one drachm of the tincture, when the os uteri was of the size of a half-crown. Labour advanced very rapidly, and the child was born in an hour and a-half. There were severe after-pains.

A fourth had ʒ iij. of the tincture, in divided doses, which much accelerated and increased the pains. She had then chloroform for six hours.

—I have since been informed, that the severity of the pains was so great as to cause some alarm, and chloroform became necessary to produce insensibility.

Case 1.—Was a natural labour and eighth pregnancy. The first stage was not completed till twenty-four hours after the woman was seized. Hemp was given four hours before its completion. After the first dose of eight drops, little effect was observed; but after the second of twelve drops, the duration of the pains was increased, and the interval shortened; and it was very obvious that the intensity of the pains, counting from the second pain after the hemp was given was increased; by the fourth or fifth pain the effect wore off, and hemp was not again given.

Case 2.—This was a second pregnancy. Seventeen drops of hemp were given in the second stage. The second pain, after the hemp was taken, was lengthened, and the interval shortened; this was not the case with the third pain; but the intensity of the pains was much increased and the woman was speedily delivered.

Case 3.—First pregnancy. Hemp was given in the second stage of labour, and the chief fact observed was increased intensity of the pains; the duration of the pains was slightly increased, and the intervals decidedly shortened, after the second dose of hemp. Twenty drops were first given, and after twenty minutes thirty drops more. Twenty-four hours after, twelve drops were given, and after-pains were induced, which the woman said were "quite as bad as when she took in labour first."

Case 4.—First pregnancy. Twenty-five drops of the tincture were given at the completion of the first stage; after this, both the pains and the intervals were shortened, and the intensity of the pains increased. After one or two pains the effect wore off, and thirty drops more were given at the end of half an hour. The third pain after this became very intense; and pain succeeded pain without intermission for several hours. As there was deformity of the pelvis, chloroform was administered, and delivery accomplished by the forceps.

Case 5.—First pregnancy. Hemp was given during the second stage, first thirty drops, and then thirty-five drops after half an hour, and the patient was delivered during its action. The effect of the first dose was chiefly shortening the interval at first, and prolongation of the pain; but the effect on the interval was more marked after the second dose. The pains were described by the patient as more intense, and by examination it was ascertained that the head of the fœtus was more forcibly propelled.

Case 6.—First pregnancy. Thirty drops of hemp were given in the second stage, and the effect was very decided. Previous to the administration of the hemp there had been no progress for an hour, the patient was nervous and excited, and though she complained much of the pains, the contractions of the uterus were felt to be feeble, and the child's head did not move; but on the second pain after the cannabis the contractions became very strong, forcing down the head, and the child was expelled ten minutes after the hemp was given. At the same time there was no decided effect on the duration of the pains and intervals.

Case 7.—Sixth pregnancy, with the first stage not completed. Thirty-two drops were given, and the action was well marked; the woman said, the second pain after it was the strongest she ever had. After an hour and a half, forty drops were given, but the action was not attended to; and in an hour and a quarter fifty drops were given, but there was no action on the pains; they became irregular, and the intervals were very long; the case was then allowed to proceed naturally. There seemed to be a tolerance of the remedy; for though 120 drops had been taken, no physiological effect of any kind was induced.

In these cases, then, it does not appear that the duration of the pains, or of the intervals was materially affected in all; but in cases 1, 2, 4, prolongation of the pain and shortening of the interval were most obvious; while in case 5, a shortening of the interval corresponding to each dose of hemp was observed. Shortening of the interval was in general a more conspicuous phenomenon than prolongation of the pain. Upon the whole, however, I am not inclined to lay much weight upon these results. But there can be no doubt that the *intensity* of the pains was greatly augmented by the hemp, except in the last case, where, after the effects of the first dose passed off, no action followed the repetition of it. This case was an exception to all the others.

It is worthy of remark, that in none of these cases were the ordinary physiological effects produced; there was no excitement or intoxicating action, and there did not seem to be the least tendency to sleep in any of them.

In conclusion I may state what appears to be the most obvious difference between the action of ergot of rye, and that of Indian hemp. First,—While the effect of ergot does not come on for some considerable time, that of hemp, if it is to appear, is observed within two or three minutes. Secondly,—The action of ergot is of a lasting character, that of hemp is confined to a few pains shortly after its administration. Thirdly,—The action of hemp is more energetic, and perhaps more certainly induced, than that of ergot.

There appears little doubt, then, that Indian hemp may often prove of essential service in promoting uterine contraction in tedious labours.

More extended experience will show how far these effects may be depended on, and to what cases hemp is most applicable.

Mode of Administration.—Indian hemp may be administered in several ways. The extract, in the form of pill, produces the most gradual effect, and the disagreeable taste of the solution is avoided; but its action in this form is very uncertain. The following emulsion has been recommended:—A scruple of the extract rubbed in a warm mortar with a drachm of olive oil, to which are added half an ounce of mucilage, and seven ounces and a half of distilled water (Bromfield). But the simplest method is to use the tincture, which should be dropped into a little water, and immediately swallowed. The water may be sweetened with sugar; or an aromatic, as compound tincture of cardamon, may be added. The usual strength of the tincture is three grains of the extract to a drachm of rectified spirit.

The extract may be given in doses of one to six grains; the tincture

in doses of ten to thirty drops, for ordinary purposes. Less than thirty drops is of little service in promoting uterine contractions; and greatly larger doses, as much as one or two drachms repeatedly, must be used in the treatment of tetanus, in which disease there is very great tolerance of the remedy.—*Monthly Journal of Med. Science, July and Aug.* 1851, *pp.* 39, 117.

155.—EPITHELIAL CANCER OF PHARYNX AND TRACHEA—IMPENDING SUFFOCATION—TRACHEOTOMY—LIFE PROLONGED FOUR MONTHS—POST-MORTEM APPEARANCES.

Under the care of Dr. Barlow, Guy's Hospital.

[This case occurred in a female, Francis P., æt. 31, an unmarried woman, who had been living in service as cook. Had always enjoyed good health, and been very temperate. Had had some difficulty in swallowing for many years. About two months before admission, she had caught cold, when the symptoms became much worse, there being present increased dysphagia, some dyspnœa, pain about the throat, and failure of voice. These symptoms were not relieved, and on admission she had great difficulty in swallowing, and could localise the pain to a spot behind the larynx; the dyspnœa was especially great at night, the air giving a sharp sound at deep inspirations. In spite of all remedies she grew rapidly worse, and the emaciation was so great that cod-liver oil clysters were given, but from irritable and partly inflamed piles, these could not be borne. The dyspnœa now became so distressing and suffocation so apparently imminent, that the operation of tracheotomy was performed. Mr. Poland describing it says:]

The operation was easily executed on account of her emaciated state; a small longitudinal incision was carried down to the trachea, with scarcely any bleeding, and then the trocar and canula pushed between the rings into trachea; the trocar was removed, and the canula fixed by tapes. A gush of air rushed out, the breathing soon became tranquil, and in the course of a few hours the patient sank into a quiet slumber.

From this time the patient improved greatly; the breathing became quite natural and easy through the tube, and the swallowing also was not so difficult, fluids and soaked bread passing readily down the œsophagus. A local application of caustic solution was brushed over the back of the throat and larynx to arrest, if possible, the disease.

About the early part of October she began to gain flesh, and was able to get up for about an hour or so. She had occasional attacks of constipation and diarrhœa, which were immediately obviated. During the months of October and November she made very little progress either way; she could swallow fluids pretty well, and breathe comfortably, but occasionally complained of pain about the sides of the larynx, and more so when it was moved about laterally; there was also some sensible enlargement at that part, and some hard nodules could be felt. The inner tube up to this time required to be taken out and cleaned only twice a day, but now, owing to the increased secretion of mucus, it was necessary to remove it three times.

In December the patient became worse; the difficulty of swallowing increased slowly, and the breathing was not so free. The tube also began to be displaced and tilted forwards, evidently indicating the progress of the disease downwards, and pressure on the trachea below the end of the canula.

Towards the end of December and beginning of January, pneumonia of a low type set in; the cleansing tube required to be removed more frequently, and was always clogged up with firm, tenacious, rusty secretion. She could hardly swallow even fluids, which caused burning pains and spasmodic coughing, producing asphyxia. Now and then some of the fluids given would find their way through the tube, consequently enemata of nutritious fluids were administered. She, however, slowly declined and emaciated rapidly; she had one or two attacks of asphyxia, gradually got weaker, and died exhausted on January 10th, 1850, four months after the operation, and six months after her admission.

The canula or outer tube was removed only four times after the operation, and was with difficulty introduced again without the aid of a blunt trocar for its more ready insertion.

Post-mortem examination, Jan. 11, 1850.—The body was extremely emaciated, and weighed only 50 lbs.; the height was 5 feet 3 inches. The os hyoides somewhat displaced. The thyroid glands were enlarged, and converged inferiorly, so that their two extremities were in close approximation. The inner edge of the left one had been just grazed by the knife. There was an irregular opening in the trachea through the second and third rings, almost hidden by the thyroid gland, requiring the separation of their lobes in order to expose it fully. All traces of the cricoid cartilage were gone, a mere thin cartilaginous membrane being left. Some enlarged and hardened glands occupied the space between the trachea and œsophagus on the right side.

On laying open the pharynx and œsophagus from behind, it was found that the whole of these structures were involved in that form of malignant disease denominated "Epithelial Cancer," partly ulcerated, and extending from opposite the hyoid bone to near the bifurcation of the bronchi. The disease had involved the whole of the posterior part of the larynx and trachea, as far as the sixth tracheal ring. There was great pressure and consequent flattening of the larynx, so that the anterior and posterior walls were in contact. Opposite to, and just above and below the seat of tracheotomy, there was an extensive, ulcerated opening, forming a communication between the trachea and œsophagus. (*See* Preparation in Museum, 1793^{20}.) No cancer could be found in any other part of the body. There was recent lobular pneumonia of both lungs, and in part suppurating.

Remarks.—This case affords a very interesting and typical example of a certain class of malignant growths, termed "Epithelial Cancer." The skin and mucous membranes are their seat; and the disease generally attacks those parts most liable to abrasion of the cuticular surface, thus the several narrow parts of the mucous canal, as the œsophagus, behind the larynx, the pylorus, and the rectum. The disease runs a peculiar and almost constant course; it commences as a tubercular elevation, which spreads slowly along the mucous tract, interfering with the

functions of the part, and sooner or later taking on an ulcerative action. The disease progresses by extension, and often remarkably slowly, as in the above case; but frequently it will assume a more rapid course, if any local irritation be set up: it generally kills by its local influence, and not by constitutional contamination. In the inspection of all the cases of this class that I have had an opportunity of seeing, there has been found no trace whatever of malignant disease in any other part of the body, thus at once characterising the disease as one of purely local cancer.

With regard to the diagnosis of this case, it was pretty evident that the obstruction was seated opposite the thyroid cartilage, that it involved both the pharynx and larynx, and that the obstruction was not owing to external causes, for none could be felt, but that it was a disease in the tubes themselves. The only other question to be raised, is the propriety of the operation of tracheotomy; this, however, is answered at once by the result, the patient living four months, and the greater part of that time in comparative ease and comfort.—*Guy's Hospital Reports*, Vol. vii, 1851, *p.* 317.

156.—EPITHELIAL CANCER OF THE FEMALE GENITALS—OPERATION—RECOVERY.

[Ann B——, aged 48, admitted March 5, 1851. Had had six children and seven miscarriages, five of them occurring after the last child. No history of syphilis. Menstruation had ceased a year. Ten years before a numbness had been felt in the external genitals, and afterwards upon the upper and inner surface of the left labium, a small, hard swelling, of the size of a pea, was noticed, which slowly spread, softened, and became an ulcerated surface. Latterly it had become so painful as almost entirely to prevent sleep.]

Dr. Oldham writes—"There is a deep excavated ulcer, of the size of a crown piece, with a rough, hardened, and uneven base, which has destroyed the clitoris, and has extended to the upper part of both external labia, leaving the lower part quite free. The upper margin of this malignant sore has a hard elevated edge. The nymphæ are not implicated, but this structure bounds the lower edge of the ulcer. The vagina and uterus are free from disease; and on the most careful examination, there is no evidence of malignant disease either in the neighbouring lymphatic glands or elsewhere." Ordered:—

℞. Potass. iodid., gr. iv; liq. potassæ, ♏x, ex inf. cascaril., ter die; lot. liq. calcis c. opio; morph. acetat., gr. ½; o. n.

Dr. Oldham thought that the parts might be removed; and Mr. Poland, after consultation with Mr. Hilton, proceeded to the operation.

March 18th. The patient was placed on the operating table, in the position for lithotomy, and under the influence of chloroform. The whole of the mass was grasped with the left hand, and the entire disease removed with one sweep of the knife. Not much hemorrhage ensued, and only five arteries required tying. Pressure with a T bandage ap-

plied. On the following day the urine had to be drawn off; but considerable difficulty was experienced in finding the orifice of the urethra, as its upper margin had been just shaved by the knife, and the urethra had retracted and was hidden by the wound. The woman progressed favourably, she had not a bad symptom, and the wound healed up by granulation very rapidly. She was presented in April, and was looking much improved in appearance.

[Another case of this kind occurred in Rachael L——, aged 46. Had been married twenty-five years; had had two still-born children and two miscarriages; had always been of a nervous temperament, and subject to all sorts of dyspeptic symptoms. Her grandmother and mother had died of bleeding cancer of the womb; her father died of tumours in this hospital; and her brother, aged 60, had a large tumour under his arm.]

Twelve months before she had contracted gonorrhœa from her husband. About six months since she perceived a lump in the left labium, which was attended with scarcely any pain; this soon increased, but was afterwards followed by ulceration; extending at first rapidly, and discharging a large quantity of serum; but again becoming quiescent. About a month before she had experienced severe lancinating pains in the part, and the disease began again to progress, and to discharge a dirty, sanious, bloody fluid. It had been slowly spreading up to the present period. There was a large excavated ulcer, of the size of a crown piece, involving the clitoris, urethra, a portion of the vagina, and the upper part of the nymphæ; the edges hard, slightly everted; the surface irregular, ulcerating, and discharging a thin sanious fluid. Dr. Oldham could detect no disease of the vagina and uterus, and there was no evidence of implication of the surrounding tissues. Excision of the whole disease was determined upon; and on the 29th of April, under the influence of chloroform, the entire mass was removed by the knife. Not much hemorrhage, and no vessels required tying. Pressure, and the T bandage was then applied. No untoward symptom occurred; she passed her water freely on the following day, although the anterior quarter of an inch of the urethra had been removed. The wound soon began to granulate, and during the early part of June she was presented perfectly well.

Remarks.—Here we have again two excellent specimens of epithelial cancer; the one of ten years' standing, the other of only twelve months' duration, showing the irregularity of the disease. Its peculiarities are strikingly depicted in each case, both as regards its local nature and its progression by extension. It is an exactly similar disease to that of chimney-sweeper's-cancer; the one being an epithelial disease of the skin, the other of the mucous membrane. Both, if unchecked, progress by extension and destroy life, either by exhaustion, in the shape of a large, ulcerating, serous-discharging sore, or by extension along the lumbar glands. They are purely local diseases, but unfortunately liable to a return. Having examined several cases of death by cancer scroti, I can fully and confidently assert that no other organ or tissue was affected with cancer, excepting they were implicated in the disease itself.—*Guy's Hospital Reports*, Vol. vii, 1851, *p.* 326.

157.—NEW GALVANIC APPARATUS.—DR. PULVERMACHER'S HYDRO-ELECTRIC CHAIN.

[The following ingenious and novel mode of applying galvanism as a remedial agent to the human body has been brought forward by M. Pulvermacher. The apparatus was placed in the Great Exhibition.]

The apparatus is in the form of a chain battery, which may be worn continuously on or around the affected part; and it differs from the other forms we have already noticed in affording a weak and almost painless current, which occasions little or no inconvenience to the wearer. The construction of the chain battery is thus described by the inventor. "In order to produce a large surface within a small space and with little material, positive and negative wires (*of zinc and brass*) are coiled round a small lengthened piece of wood in such a manner that they run parallel to each other at very small distances, but without immediate contact. At each extremity of the wooden core, the end of one of the wires is bent into a gilt eye. (the other end being fixed into the wood,) so that at one extremity of the wood, the eye from the positive wire, at the other extremity that from the negative wire, project beyond the core. The whole forming the metallic part of a galvanic element, with space between the wires for the fluids. A number of such elements linked together on the principle of the voltaic pile, therefore, constitutes the metallic part and arrangement of a battery, permanently connected, flexible in all directions, of considerable surface (quantity) in proportion to its size, and of an intensity, only limited by the number of elements employed. These batteries, although so small and light, are capable of producing powerful effects, as we have ourselves experienced, and we have no doubt that all the statements made by the inventor in his prospectus are correct. Thus a powerful shock can be obtained by a battery of 120 elements charged with distilled vinegar; and when the two halves of the battery are connected by an interrupting cylinder, consisting of a spring fixed in a small glass tube, so that every motion of the instrument breaks and renews connexion, producing a vibratory current, the effect is almost insupportable, and approaches in character to the more powerful electro-magnetic machine. The inventor states that a battery of eighteen of the elements decomposes acidulated water, while one of 150 produces visible sparks with the interrupting clock-work. Another curious effect is produced by these batteries, when the clock-work apparatus just mentioned is added to the apparatus, that of exciting rather powerful muscular contractions, unaccompanied by any considerable amount of pain. We have personally tried the apparatus, and can vouch for the accuracy of the statement that, while muscular contractions were excited, little pain or other inconvenience was produced. The exciting fluid may be either water, together with the perspiration, the mildest form in which it can be applied, which produces a "constant mild irritation, felt as a slight itching, and the production of small pimples; or vinegar, when charged with which, the battery produces a burning sensation at and near the poles. When the interrupted current is required, as in paralysed limbs, the small glass tube or interrupting cylinder may

be inserted in any part of the chain, by which slight but sensible shocks are produced by every movement of the body.—*Med. Times, August* 2, 1851, *p.* 130.

[Dr. Pulvermacher's modification of Volta's pile has attracted so much attention that the following account of its value, by Dr. Golding Bird, cannot but be interesting.]

Everybody is aware that the apparatus contrived by Volta consisted of plates of metals, differing in their respective affinities for oxygen, alternated with pieces of cloth dipped in a saline solution. Thus, in the most common modification of this pile, a plate of copper is placed on the table, on this a plate of zinc, and then a piece of flannel or cloth, dipped in a solution of common salt; on this a second plate of copper, and so on. The theory of the apparatus is so well known, that it is unnecessary to say more than that, under the chemical action of the saline fluid on the zinc, the combined electric fluids existing normally in both the two metals employed, are separated,—the positive electricity being found on the zinc, and the negative on the copper surface. Wollaston's and Cruikshank's are but modifications of the same contrivance,—cells filled with the saline fluid replacing the moistened cloth or flannel. The cumbrous nature of those contrivances, the time required to excite them, the rapidity with which the intensity of the electric current diminishes, as well as the tact and management required to apply the current they evolve, have always presented most serious obstacles to their adoption into medical practice. On this account they have been almost completely replaced by the different machines for furnishing a current of induced electricity. These, it is true, possess many advantages, and become most important appliances in the treatment of disease, as has been repeatedly pointed out by myself and others. Still we have often felt the want of an apparatus by which a uniform and uninterrupted current of voltaic electricity could be at our command at a short notice, and without involving the necessity of any manipulative tact in its application. The hydro-electric chain completely fulfils these desiderata.

The apparatus I have used, was placed in my hands during last winter, by Dr. Pulvermacher himself. He is a scientific man, and well acquainted with physical science generally, nor is he, I presume, responsible for the manner in which his invention has been extolled, as a sort of universal panacea, by the London agent in the public advertisements. Each element of this battery consists of a small piece of wood, around which are wound two wires, nearly but not quite in contact, one of these wires consisting of zinc, the other of gilded copper. These represent the plates in Volta's pile; each terminates in a ring, by which it is connected with the wires of the next link or member of the chain, the zinc of one being united with the copper of the next, and so on. When one of these links is immersed in a fluid capable of exciting a chemical action on the zinc, enough is retained by capillary attraction between the folds of wire to disturb the electric equilibrium of the metals, and to throw the negative and positive fluids into a state of current. The exciting fluid recommended by Dr. Pulvermacher is common vinegar,

and if one of his chains be immersed in that fluid for a minute, and then lifted out, so that all not retained by capillarity may drain off, it will be at once fit for use.

The electricity excited by this apparatus is necessarily small in quantity, as the amount of electricity evolved must be in a ratio with the intensity of the chemical action exerted on the more oxidizable metal; yet its tension is tolerably high. It is indeed sufficient, both in quantity and tension, for the development of physiological phenomena. The following experiments will illustrate these properties, a chain of fifty alternations being employed:—

a. A thin piece of platinum wire being attached to the terminal links, they were immersed in water acidulated by sulphuric acid, and very distinct evolution of exceedingly minute bubbles of oxygen and hydrogen were evolved from the two wires. The dilute acid being replaced by a solution of iodide of potassium mixed with starch, iodine was almost immediately set free at the wire where the positive current entered the fluid. The quantity of these electrolytes decomposed was exceedingly small, as the electrolytic power of the evolved current would of course bear relation to the amount of effective chemical action going on in the links of the chain.

b. The platinum wires were then connected with an astatic galvanometer; the wires were immediately deviated under the influence of the current, but the latter was not sufficient to retain the needles at right angles to their normal position. The astatic galvanometer was then replaced by an ordinary one, having a coil of thirty folds of wire, and carrying a magnetic needle, five inches long. The current was barely able to produce a permanent deviation from the magnetic meridian of five degrees. This feeble action on the magnetic needle is explained by the small *quantity* of electricity circulating through the chain.

c. The chain being held in a vertical position by one end, the terminal link was allowed to touch for an instant the lower plate of a condensor, six inches in diameter, in connexion with a gold-leaf electrometer. On lifting off the upper plate the gold leaves separated to the extent of a couple of inches. When only half of the chain was brought in contact with the electrometer, considerable divergence also occurred. This experiment well illustrates the comparative high tension of the evolved electricity.

d. The first and last link of the chain being placed in cups of water, and a finger of each hand being immersed respectively into the two cups, a smart shock was experienced in each finger. This shock was repeated every time one finger was *raised out* of the fluid and redipped. But no shock was felt all the time the finger *remained* immersed, as the electricity passed in a continuous stream through the body from one end of the chain to the other. The physiological phenomenon of "shock" being produced only at the moment the current first entered the body. This is of course the same with all voltaic apparatus which yield an uninterrupted current.

These experiments are sufficient to demonstrate the electrogenic power

of Pulvermacher's apparatus, and to point out that the current evolved is small in quantity, but of moderately high tension.

When a continuance of sensible shocks is required, an ingenious apparatus, contrived by the inventor of the chain, may be used. This consists of a small helix of thin wire fixed in a glass tube; one end of this wire passes through a cork in the tube, and ends in a hook; the other end is free, and is barely in contact with a metallic plate, (also furnished with a hook), which closes the other opening of the tube. On connecting a chain of fifty elements to each of the hooks of this apparatus, the first and last link being grasped in the hands, a rapid succession of rather violent shocks will pass through the arms. These occur in consequence of the slight motion communicated to the chain by the hands, being sufficient to make the helix vibrate, and thus rapidly approach and recede from the plate at one end of the tube.

It must not be supposed, however, that sensible shocks are required to develope physiological phenomena or therapeutical effects. We are chiefly indebted to the laborious researches of Dr. Marshall Hall for teaching us the vast amount of therapeutical influence developed by a continuous current of voltaic electricity. I cannot, indeed, too strongly impress upon those who have to treat a case of old paralysis (unconnected with spasm) the vast importance of allowing a current of voltaic electricity to traverse the palsied limbs persistently for half an hour or more daily for weeks and months, nor to be disappointed at not witnessing any *immediate* good results. Nutrition of the limb is certainly thus increased, its waste and emaciation prevented, at least to some extent, and the probabilities of cure are much increased. Pulvermacher's chain, when once excited by immersion in vinegar, soon begins to evolve a current of decreasing intensity; but so long as even a small quantity of fluid remains unevaporated between the folds of wire, evidence of the circulation of electricity can be made out by the electrometer. A moment's re-immersion in vinegar will at once restore the energy of the current.

The advantages of this apparatus to the medical man consist in its giving him a means of obtaining a current of electricity, of amply sufficient tension and quantity for all physiological purposes, at a moment's notice. He can, moreover, diminish or increase the tension by making use of a greater or smaller number of links. He can make the current continuous or interrupted, painful or painless, at will,—and he has, moreover, an apparatus so easily managed as to require no especial tact for its application. On the other hand, it must be recollected that the current evolved has no *peculiar* properties, and that it will effect nothing more than that evolved by any other means. It is indeed, deeply to be regretted that so convenient a source of electricity runs the risk of losing favour in the sight of educated men generally, and of our profession in particular, by being injudiciously puffed in the public prints, by advertisements claiming for it a medical influence it in no wise posesses. —*Lancet, October* 25, 1851, *p.* 388.

157.—*On the Influence of Variation of Electric Tension as a Cause of Disease.* By W. Craig, Esq., Ayr.—[Mr. Craig thus recapitulates the heads of the arguments he has advanced in a very interesting paper upon this subject.]

1st. That heat and electricity are identical, as the one can be converted into the other.

2nd. That a large volume of electricity surrounds every primary constituent of matter, especially that form of matter which constitutes the gaseous bodies.

3rd.—That animal heat is supported by the electricity liberated from the primary constituents of matter during the processes of respiration, digestion, and assimilation.

4th. That electricity is evolved during these processes on the same principle as that which is evolved during the action of a galvanic arrangement.

5th. That electricity and nervous power are analogous, if not identical; as the action of the one can be successfully substituted for the other.*

6th. That the majority of diseases are caused either by the sudden abstraction or slow abduction of electricity from the body.

7th. That a low state of electric tension on the surface of the earth, produced either by the operation of evaporation or some occult movement in the great internal currents of the earth, is the remote cause of epidemic and pestilential diseases.

8th. That occasional and ordinary diseases are produced by the sudden abstraction or slow abduction of electricity from the body, or its undue elimination during the vital processes.

9th. That since electricity is so essential to the integrity of the vital operations, it is indispensable that measures be taken to promote its evolution and prevent over-radiation.

10th. That electricity is the source of vitality in vegetable life.

11th. That electricity is attracted by the fibres of the roots of the plants; and by the instrumentality of the electric fluid does the plant extract its constituents from the soil.

12th. That vegetables of rapid growth require a large supply of electricity to secure their perfection and completion; and the potatoe is a plant of this kind.

13th. That the disease in the potatoe was produced by want of nutrition.

14th. That the want of nutrition arose from defective electric agency,

15th. That the cause of the deficiency of this agency was those abstracting influences which produced low tension of electricity.—*Med. Gazette, October* 10, 1851, *p.* 625.

* This conclusion is, in our judgment, not justified by facts. Nervous power cannot be transmitted by anything but *nerve*. Electricity may be transmitted by a variety of conductors, organic and inorganic, and of these, nerve is one of the worst. Animals which evolve electricity are provided with distinct organs for this purpose. By nervous power, milk, urine, and bile are secreted from blood. Electricity, in any form, cannot produce these or similar results. They resemble each other in traversing their respective conductors with equal rapidity; but this is not sufficient to establish their identity.—*Ed. Gaz.*

158.—PROFESSOR FARADAY ON SCHONBEIN'S OZONE.

Professor Faraday commenced by stating, that considerable mystery was attached to the subject which he proposed to bring before the members on the present occasion—namely, *Ozone*. This name had been given by Schönbein, of Basle, to a substance or condition of matter which manifested itself under very peculiar and widely different circumstances. Schönbein regarded it as an independent body, and a constituent of the atmosphere; but in his (Professor Faraday's) opinion, it was nothing more than an allotropic condition of oxygen. It was never manifested except where oxygen was present, and where, at the same time, water, in a liquid or vaporous condition, was found. No substance had ever been separated from the atmosphere where ozone existed; but its presence was manifested, not merely by the strong smell peculiar to it, but by certain well-marked chemical properties which the atmosphere containing it, possessed.

When electricity is produced from a powerful machine, and allowed to be discharged by a point, there is a feeling of a current or aura as of vapour escaping, and at the same time a remarkable odour. If, during the passage of the electricity, a piece of paper, moistened with a solution of iodide of potassium and starch, be brought near, the discharge causes the production of blue iodide of farina. The blue colour thus produced is the result of the oxidation of the potassium by the *ozone*, and the setting free of the iodine. This is one of the best tests for the presence of ozone It was formerly supposed that nitric acid was produced by the discharge of the spark, and that the decomposition of the iodide was occasioned by this acid as a result of the union of oxygen with nitrogen in the air; but this theory will not account for the smell and other properties of this extraordinary agent.

Schönbein produces ozone in very large quantities by introducing into capacious bottles, with glass stoppers, pieces of cut and cleanly scraped phosphorus, with a small quantity of water, so that the phosphorus may be partly in and partly out of the liquid. A vapour slowly rises in a current. After ten or twelve minutes the ozone is produced, and may be procured in a mixture with oxygen and nitrogen by removing the phosphorus at a water-bath, and thoroughly washing the interior with water, in which ozone is insoluble. This body is thus separated from the vapour of phosphorus and phosphorous acid. (This experiment was performed in three bottles, and several bottles of ozone previously prepared were now brought forward). On introducing paper, wetted with starch and iodide of potassium, into one of the bottles, there was an immediate indication of the presence of this principle, by the production of a dark blue iodide of starch. Another remarkable property possessed by ozone was seen in its bleaching powers. Some ounces of a solution of sulphate of indigo were gradually poured into a bottle containing ozone, and shaken, when the colour was as completely destroyed as if chlorine or chloride of lime had been present. A very small quantity of ozone would thus entirely discharge the colour of a very large quantity of sulphate of indigo.

It has been already stated to be so little soluble in water, that a bottle containing it may be repeatedly rinsed with water without losing its

ozonic contents. If, however the stopper be removed, and it is exposed to air, it soon passes off. Ozone appears to be entirely destroyed by heat; or, at any rate, its production by electricity ceases when sparks are received from a red-hot metallic point. This fact was ingeniously illustrated by insulating a small galvanic battery, capable of raising at pleasure a platina ball to full redness: the battery was made part of the machine, and the platina ball the terminal point from which the discharges of electricity were received. The machine was set to work, and it was clearly and distinctly proved by Professor Faraday that the discharges from the red-hot platina ball produced neither the aura, the smell, nor the decomposing effects on iodide of potassium and starch, which were immediately manifested when the ball was allowed to cool, and the electric fluid was then passed through it.

The oxidizing properties of ozone are indicated upon metals which in practice it is rather difficult to convert to oxides—namely, silver. A piece of polished silver had been placed in a bottle of ozone for several hours, and had acquired a distinctly brown tarnish, not from sulphur, but from a process of ozonation, or, in other words, oxidation. Polished lead similarly treated was also oxidized. Ozone had always a tendency to bring metals and metallic oxides to their highest degree of oxidation. In this respect it was the most powerful oxidizer that was known. A tube containing several rings of metallic arsenic had been placed for a short time in a bottle of ozone. The metal had entirely disappeared, and had become transformed into arsenic acid. Paper wetted with a solution of proto-sulphate of manganese was introduced into a bottle of freshly prepared ozone, and in the course of a short time black spots, appeared over the surface, proving that the manganese had passed to a higher degree of oxidation.

Nitrogen and sulphur are easily oxidized by it. Schönbein succeeded in procuring a quantity of nitre (of which a crystallized specimen was shown) by the agency of ozone in contact with nitrogen (of air) and potash. Sulphur was also converted into sulphuric acid. Paper stained with sulphuret of lead was immediately bleached when exposed to an ozonic atmosphere. Some curious experiments of Schönbein's were now shown, in which portraits and inscriptions were seen in white letters on a dark ground, as a result of placing stencilled metallic plates on paper which had been stained brown by sulphuret of lead. The uncovered spaces had been exposed to light and air, or *insolated*. The result was that in these spots the sulphuret of lead had entirely disappeared, having been converted to colourless sulphate of lead by the oxidizing action of ozone.

The alleged bleaching properties of solar light on coloured articles are thus probably due to the agency of ozone,—in other words, to a process of oxidation and alteration of the colour.

Sulphuretted hydrogen, phosphuretted hydrogen, and all foul effluvia, are speedily oxidized and destroyed by ozone. It is, therefore, the great purifier of the air; and, owing to its continual exhaustion by oxidating processes, it is difficult to discover the presence of ozone in large and populous places, or in close and crowded dwellings. In the open air of the country, and on the sea, it constantly exists in a proportion which

is probably subject to great variation, although ruled by laws which are at present unknown. Schönbein had contrived an *Ozonometer* for testing the amount contained in air. It is prepared by immersing paper in a solution made of one grain of iodide of potassium, ten grains of starch, and two hundred grains of water. The paper is dried, and, when intended for use, is exposed for some time to the air. There is no change until it is wetted with water, when, if ozone was present in air to which it had been exposed, a blue colour will appear, the intensity of which varies according to the quantity of ozone present and the length of exposure. The ozonometer consists of a series of papers thus coloured in different degrees, and bears some analogy to the cyanometer long since proposed by Humboldt.

Professor Faraday stated that, during the last autumn, when at Brighton, while walking close to the sea-shore, he exposed some strips of this prepared paper to the current of air coming over the sea, and, on subsequently wetting the paper, the presence of ozone was distinctly manifested by the blue colour produced. On another occasion he received on the same paper the current of air blowing over the town, but no trace of ozone could be detected in it. When he went, however, on the windward side of Brighton, so as to catch the air blowing over the downs before it reached the town, ozone was strongly manifested by the result. It was thus established that in populous places there is a constant consumption of this principle.

It had been shown that ozone was evolved with the ordinary electricity of the machine: it was now proved that the current of the battery equally leads to its production. Water was decomposed by a Groves' battery, and the oxygen and hydrogen evolved were conducted through a tube in which cotton soaked in potash had been placed to arrest any traces of acid. The gases evolved at the end of the tube decomposed the iodide of potassium on starch paper, and gave the usual indication of the presence of ozone.

Ozone is evolved in numerous chemical processes. If pure ether, mixed with water, be introduced into a wide-mouthed capacious bottle, and the vapour allowed to become diffused, it will be found that litmus paper introduced is not reddened, and that starch paper prepared with iodide of potassium is not rendered blue. If, however, a glass rod be made hot in the flame of a spirit-lamp, and then introduced into the vapour of the bottle, litmus paper held above the rod becomes strongly reddened, and the iodide of potassium paper intensely blue. In the oxidation of ether vapour at a low temperature, ozone is evolved.

Ether, in its ordinary state, has no bleaching properties; but the ether thus treated had acquired the power of discharging the colour from a large quantity of sulphate of indigo.

Essential oils are thickened by long exposure to light and air: they become ozonised and their properties changed. This was illustrated by reference to oil of turpentine. Freshly rectified and pure oil of turpentine was proved, by admixture with sulphate of indigo, to have no bleaching power. A small quantity of oil, which had been exposed to air and light (the air in a bottle half full), destroyed the colour in a few minutes, like chlorine.

We cannot doubt that ozone exerts an important influence on the atmosphere, and, therefore, on the health of animals and vegetables. Schönbein, who is rather sanguine in his views, considers, from the irritant properties of ozone, that an undue proportion of it in air may give rise to epidemic influenza, bronchitis, and other affections of the air-passages; and in making experiments at Basle, he found that, concurrently with the prevalence of these disorders, ozone was very abundant in the air. On the other hand, it has been said that its deficiency in air will account for cholera or fevers, since the foul effluvia or miasmata giving rise to these diseases are not completely destroyed or removed by the oxidizing action of ozone. These, of course, are mere speculations insusceptible of proof; but, in the meantime, it must be conceded that the subject opens a new road to experiment and observation, and that very important results may be obtained by following out Schönbein's researches.

[It would be difficult to describe the intense interest which this lecture excited in a large and crowded auditory. The illustrative experiments were most ingeniously contrived, and were remarkable for their novelty. The conclusions of the lecturer were fully justified by the results.

We think Mr. Faraday has afforded the right explanation in assigning the properties of ozone to an allotropic condition of oxygen. This extraordinary element, which forms by weight one-fifth of the atmosphere, eight-ninths of water, and one-half of the solid crust of the earth, may, like other supposed elements, be capable of existing in two states (allotropic) so widely differing from each other as to possess nothing in common excepting the name. Phosphorus presents this allotropic condition: in its ordinary state it is colourless, luminous in air in the dark, forming a deliquescent acid, is soluble in bisulphuret of carbon, and melts and burns at a very low temperature, about 108°. If phosphorus be kept for a time at a temperature between 464° and 482°, its properties are entirely changed: it acquires a brownish-red colour on cooling; it requires a high temperature for combustion: so that, unlike common phosphorus, it may be safely handled and carried in the pocket: it does not deliquesce in moist air, and is quite insoluble in bisulphuret of carbon. Liebig states that, while common phosphorus is poisonous, the altered phosphorus has no action on dogs. At a low red heat, the altered phosphorus is reconverted to and reacquires all the properties of ordinary phosphorus! There is, therefore, no apparent change of matter, but merely a change of state.

Thus Mr. Faraday considers that oxygen bears the same relation to ozone that ordinary does to altered phosphorus,—that they may, under certain conditions, pass and repass into each other: but what those conditions are which produce and *regulate* the conversion of oxygen into ozone in the atmosphere it is impossible to say. Chemical agency, electricity, and magnetism, may be the constant sources of production. Decay, disease, and death, affecting alike animals and plants, may be the means by which ozone or allotropic oxygen is consumed; but what power is it that *regulates* the quantity produced, and so adjusts it that it shall conduce to health and life? This is a profound mystery. It is

obvious from what is already known, that by an over-conversion of oxygen in the atmosphere into this allotropic condition, every living being would perish; and it is not improbable that the arterialization of blood may be due, not to oxygen in its ordinary, but in its allotropic state. It is commonly said that oxygen is absorbed as such, and the red corpuscles of blood are regarded as oxygen-carriers; but the researches of Schönbein open a new path of research for physiologists.

It has been a mystery whence those sulphates and nitrates are derived, which are frequently found in freshly collected rain water that has only washed the atmosphere. Ozone may be the agent by which the sulphur-gases and ammonia that are diffused in the atmosphere become oxidized and transformed to acids and salts. Acid springs, which are found in some parts of the world, and the great nitre beds of Ceylon, and on the coast of Peru, may owe their origin to this allotropic influence in past ages, and still working slowly at the present time. Although ozone does not appear to be dissolved by water, it is a question whether the oxygen in that liquid may not assume an ozonic condition, and thus account for the rapid conversion of nitrogen, sulphur, and phosphorus, or the compounds containing them, to nitrates, sulphates, and phosphates. Every chemist knows the rapidity with which sulphuretted hydrogen is decomposed in all kinds of water exposed to air:—sulphur is precipitated, or, if a base be present, acidified, and a salt formed. Oxygen, therefore, either in its ordinary or allotropic state, is the great purifier of air and water.

Oxygen in combination may be frequently in the ozonic state, or may become so during its evolution. Chromic acid not only bleaches, but sets free iodine from iodide of potassium. Peroxide of hydrogen and other hyperoxides have a similar action. Chlorine and bromine resemble ozone in their bleaching powers, and in their action on iodide of potassium. The bleaching is commonly referred to *nascent* oxygen, because dry chlorine has no such effect; but for the term nascent we may now, perhaps, be justified in substituting the word *allotropic*, and refer the effects to the ozonic condition of oxygen.

The oxidation of the metallic sulphurets by ozone throws a curious light on the probable cause of the destruction of photographic drawings. If any sulphuret of silver be left in the finished drawing, the drawing is slowly bleached, and the sulphuret converted into sulphate of silver. In drawings which have been framed the change is observed to commence on the external margin, and slowly spread to the centre. There are many other remarkable chemical changes which will now probably receive a more satisfactory explanation than has been hitherto assigned to them.—Ed. Gaz.]—*Med. Gazette, June* 20, 1851, *p.* 1091.

A SYNOPSIS,

CONTAINING

A SHORT ABSTRACT OF THE MOST PRACTICAL ARTICLES IN THE FOREGOING PAGES OF THIS VOLUME; AND SHOWING, AT A GLANCE, THE MOST IMPORTANT INDICATIONS OF TREATMENT PUBLISHED BY DIFFERENT WRITERS WITHIN THE LAST HALF-YEAR. (ARRANGED ALPHABETICALLY.)

DISEASES AFFECTING THE SYSTEM GENERALLY.

COLLAPSE.—To arouse the vital energies of the human frame, in cases of cholera, suspended animation, and other causes of apparent sinking from threatening collapse, apply scorching hot pillows placed along the spine every ten minutes. (Mr. Haynes, *Lancet, September* 6, 1851, *p.* 224.)

DROPSY.—In a case of general anasarca, with ascites, after all other remedies had failed, the patient was cured by the following liniment being applied three times a day to one half the surface of the body:—R. Volatile liniment, two parts; tincture of cantharides, tincture of colchicum, tincture of digitalis, tincture of iodine, of each one part. The patient recovered in a few days. (Mr. W. W. Finch, *London Journal of Medicine, August,* 1851, *p.* 726.)

FEVER. *Continued.*—Quinine seems to be very valuable in this disease. It has been given from the apparent analogy of the continued fever of this country with that of tropical climates. Thirty grains of the disulphate have been given in three doses, and the next day the patient has been found with a cessation of the pain of the head and the delirium; the abdomen less tender; the heat of the skin diminished; and the tongue clean and moist. Mr. Eddowes, of the Liverpool Fever Hospital, has given it also in doses of five grains every three hours, and says that, the day but one after its administration, the patient is generally found better; the petechiæ gradually fade, and the fever leaves its unhappy victim. (Dr. Robert Dundas, p. 11.)

Hay Fever.—From the nature of the mucous membrane. pertaining something of the analogy between its pathological condition and that of the skin in certain forms of prurigo, arsenic was tried, in five minim doses of Fowler's solution, three times a day. In six days nearly every vestige of the complaint had disappeared. The cases of hay fever chiefly benefitted by arsenic are of a catarrhal rather than of an asthmatic character. Five drops may be given of the solution three times a day. Dr. Fowler recommends the following rules for its administration:—Patients, from 2 to 4 years old, may take two to four drops of the solution; from 5 to 7 years, may take from five to seven

drops; from 8 to 12 years, may take from seven to ten drops; from 13 to 18, may take from ten to twelve drops; and from 18 and upwards, may take twelve drops as a dose. If the medicine fails to do good, it may then be alternated with quinine, or they may be given concurrently. (Dr. F. W. Mackenzie, p. 15.)

Gout.—The distinguishing points between rheumatism and gout, are, in the latter, the age of the patient; his diathesis; his habitual use of malt liquor; the rapid or sudden way in which the attacks come on; and the fact, that the parts first affected were the small joints, especially the metatarso-phalangeal joint of the great toe and the tarsal joints. In rheumatism, there is always a great tendency to sweat, and the ankles and knees are generally first attacked. As to the heart affection in rheumatism, there is a proneness to fibrinous concretions on the pericardium or endocardium. In gout, the nutrition of the muscular structure suffers, and inorganic deposits (lithate of soda, phosphate, and carbonate of lime) take place in the chordæ tendinæ, and other parts of the fibrous tissue of the heart, ultimately impairing the efficiency of the valvular apparatus. An active antiphlogistic treatment creates asthenia, and this gives a shifting character to both diseases, perilous to both, but especially so to gout. By moderate purgation, the use of diaphoretics, by keeping the joints warm, and if the urine be very acid, by the administration of alkalies, we may to some extent expedite convalescence, and undoubtedly relieve pain. Counter-irritation, by means of a small blister, is of decided utility in many cases, both in relieving pain and removing the effusions or thickenings which remain in gouty joints. Colchicum holds a curious relation to gout, sometimes for good, sometimes for evil; in the majority of cases perhaps the latter. In sthenic cases, in young subjects, it relieves pain, but though it shortens the duration of the attack, it likewise shortens the interval between the attacks; and, as the system is very tolerant of the remedy, there is great danger of immense doses being ultimately required to produce a decided effect. (Dr. R. B. Todd, *Med. Gazette, September* 12, 1851, *p.* 441.)

The chief remedies in some cases, under Dr. Todd, were the use of opium, free counter-irritation over the epigastric region by mustard and turpentine, and the exhibition of the sesquicarbonate of ammonia, allowing three or four grains in excess. The opium may be given in the form of morphia, at bedtime, in a draught. It has been tried with the combination of the acetic extract of colchicum, but this seems to depress. When the erysipelatous state is at its height, fifteen minims of the chloric ether may be added to the dose of the sesquicarbonate of ammonia as a grateful stimulant. Lemon juice is a valuable remedy, increasing the quantity of urine often in a very marked way. (Dr. R. B. Todd, *Med. Gazette, October* 3, 1851, *p.* 565.)

Glanders, *Acute.*—In a case of this kind, a concentrated form of the sesquicarbonate of ammonia was given. From its beneficial effects in severe affections of the throat, which are met with in malignant scarlet

fever, two drachms of the carbonate of ammonia are dissolved in five ounces of water; the patient to take two teaspoonfuls every two, three, or four hours, according to the urgency of the symptoms. It may be administered in erysipelas, rubeola, scarlatina, urticaria, roseola, and erythema, with all their varieties. (Dr. F. W. Mackenzie, p. 38.)

Phosphate and Oxalate of Lime.—In all chronic diseases which are distinguished by wasting, emaciation, ulcerations of the skin, &c. (as scrofula, especially rickets, &c.), a much larger quantity of phosphates is removed from the economy by the urine than ought to be in the normal state; indeed, in some cases, to an almost incredible extent. The phosphates of lime and magnesia are held in solution in the urine by its acidity, and directly precipitated by the addition of alkalies, or when the urine becomes ammoniacal by putrescence. This precipitation is more complete by heating or boiling the urine, and by adding a solution of soda to boiling urine the whole may be precipitated; and by always using the same solution of carbonate of soda, say, one to twelve ounces of distilled water, the degrees of turbidity may be readily recognised, and the quantity of phosphates ascertained. There is scarcely any disease in which at one time or another an increase in the quantity of phosphates does not take place; but as the times are quite uncertain, there is necessity for almost daily examination. The increase, however, does not depend so much upon the nature of the disease as upon the individual affected. (Dr. Beneke, p. 402.)

Scarlatina, *Delirium and Coma of.*—In a case of scarlatina, with these symptoms, colchicum was given in the following form:—℞. Sp. æth. nit. ʒ iij.; pot. acet. ʒ ij.; tinct. colchici. ℥ ss.; aquæ ℥ iij.; M. ft. A teaspoonful to be taken every four hours. The coma and delirium disappeared on the following day. Before the administration of the colchicum the urine was free from deposit, but subsequently a much larger quantity was passed, and loaded with a deposit of urate of ammonia. (Professor Bennett, p. 21.)

Scrofula.—We should try to prevent it. 1st. Where a taint exists in the mother, the state of health during the period of utero gestation, should be regarded with the most anxious care. 2nd. As soon as the child is born prophylactic measures should be resorted to during the earlier periods of life. 3rd. If no predisposition exists, localities or other external agents appearing as the sources of the disease, must be obviated. Nothing tends to produce a feeble frame of body so much as protracted nursing. Dr. Paris recommends strongly, milk impregnated with the fatty matter of mutton suet. (Dr. Shapter, p. 30.)

The best application for a scrofulous sore is certainly the iodide of lead ointment. The hyd. bichloride may be given in doses of from 1-16th to 1-20th of a grain dissolved in distilled water, or in the form of pill, with the ext. of sarsa, twice or thrice a day. In cachectic, chlorotic, and other cases attended by a languid circulation and much general debility, barium may be used as follows.—℞. Baryta chlorid. gr. x.; tinct. ferri mur. ʒ ij. to ℥ ss.; syr. aurantii ℥ ss.; aq. dest. ℥ x.

Mix; of this ℥ss. to ℥j. may be given two or three times a day. Cod-liver oil has little or no influence in the great majority of glandular tumours; but in some forms it is a potent remedy, as when associated with caries of the bones or phthisis. Phosphoric acid, as a medicine, is also most valuable. It may be given in the infusion of calumbo, beginning with five grains of the dilute acid of the pharmacopœia, gradually increasing it to twenty or more. (Mr. T. Balman, p. 32.)

Small-Pox.—As the pitting depends on a sloughing of the cellular tissue from the confinement of the water in the pock, puncture each pustule, and apply a poultice over the whole surface of the face. As the pustules are liable to form on the tongue, fauces, pharynx, and larynx, apply a few leeches over these regions externally, so as to diminish the circulation and to reduce the size of the pocks. (Mr. J. G. Pasquin, p. 36.)

AFFECTIONS OF THE NERVOUS SYSTEM.

Chorea.—In three cases arising from fear, no initial morbid state being present, Dr. Gassier applied chloroform frictions along the course of the vertebral column, by a liniment of chloroform and oil of sweet almonds, in equal parts, with complete success. (Dr. Gassier, p. 68.)

Convulsive Diseases.—Secure a pure atmosphere and a free exposure to the sun in the treatment of convulsive affections. Let the diet be generous; a moderate use of stimulants, as wine and ale, is essential, and, in a few cases, have seemed alone to ward off the attack. Gentle exercise only should be allowed. There is a great mass of evidence against bleeding, and no proof can be found that certain benefit has resulted from the practice. As to purgatives, unless there be a loaded state of the bowels, there is no reason for the employment of purgative remedies in the treatment of convulsive maladies. (Dr. C. B. Radcliffe, p. 58.)

Headache, *Intermittent.*—In intermittent headaches, brow ague, cephalalgia, and other affections in which the mucous membrane of the frontal sinuses appears to be the seat of pain, arsenic has proved efficacious. (Dr. F. W. Mackenzie, p. 19.)

Hypochondriasis.—Most cases of this disease arise in invalids from inter-tropical climates, from their giving up an accustomed stimulus, this stimulant being heat. To supply the place of this, the use of the vapour bath is a highly important agent. (Dr. Pidduck, *Lancet*, *June* 21, 1851, *p.* 670.)

Paralysis.—Brucine may be given in much larger doses than strychnine, and is therefore more manageable. At the dose of from ten to fifteen centigrammes, slight jerks and prickings are felt in the limbs. There is no cephalalgia or disorder of the mind produced. (M. Bricheteau, p. 66.)

Cerebral and Spinal.—In cases of paralysis, where the muscles of the affected limb contract under a less degree of the galvanic influence than the sound limb; and, on the contrary, where the muscles of the sound limb are more sensitive than those of the affected side: in these cases respectively, the influence of the brain or that of the spinal marrow is intercepted. The removal of the influence of the brain conduces, within certain limits, to a comparative irritability of the muscular fibre, whilst the reverse is obtained when the influence of the spinal marrow is taken off. (Dr. Marshall Hall, p. 63.)

Periosteal Disease.—This disease often affects the upper end of the humerus, and the lower end of the femur, and is often overlooked. The shoulder is aching, tender, and cannot be used on account of the pain, the muscles being inserted into the periosteum. The pain is more severe at night: there is no perceptible swelling. There soon follows a state of permanent congestion, or subacute inflammation. The hip joint is liable to a similar affection, but is more rare. In these cases the iodide of potassa must be given three times a day. If of long standing, blisters or issues must be employed. The nitric acid issue is the best. A piece of lint is to be applied the size required, not too wet with the acid, to the tender part anterior to the joint, as it is generally under the covering of the deltoid and biceps, near the joint. It should then be covered over with a piece of lint, dipped in a solution of carbonate of soda. A linseed poultice should be then applied. The slough usually comes away in five or seven days, and the discharge will continue till the pain is removed. (Dr. R. H. Goolden, p. 56.)

Affecting the Dura Mater.—The usual cases in the tropics are those who have taken large quantities of mercury for fevers or hepatic disease, having been afterwards exposed to damp in our cold and more northern latitudes. When the pericranium is the seat of the disease, it is at once recognized by the presence of great tenderness, as well as unevenness to the touch; but when the dura mater is affected, this morbid condition is not so palpable. In this case, the patients are often free foom pain during the day, but at eight or nine o'clock at night the pain sets in, and is so agonizing that they are willing to submit to any measures to obtain relief. It lasts until three or four o'clock in the morning, followed by a profuse perspiration, when the patient gets some sleep. A blister to the head, opium at night, and iodide of potassium and sarsaparilla during the day, with a good nutritious diet, have dissipated all the symptoms. (Dr. R. H. Goolden, p. 52.)

Sciatica.—In sciatica and neuralgia, associated with anemia, give cod liver oil. (Dr. T. Thompson, p. 88.)

Sulphates *as Signs of Disease.*—The increase of sulphates and phosphates in inflammation of the brain is an evidence of the increased oxidation of the nervous structures. The amount of sulphur in the brain being nearly the same as the amount of phosphorus, at one time we have evident increase of the oxidation of nervous, and at

another of muscular tissues: at one time the functions of the nerves, and at another, those of the muscles, being inordinately increased. (Dr. H. B. Jones, *Lancet, July 5*, 1851, *p.* 9.)

Tetanus.—Use frictions of chloroform all over the body. Recovery was thus brought on in a case in four days. (M. Morisseau, p. 70.)

Mr. Campbell, surgeon of the 55th regiment, says he thinks the Worrara poison has been proposed justly as a last resort in tetanus, by inserting the poison in the finger, and tying a ligature above the wound, so as to regulate its action and effect in the system. (*Lancet, July 5*, 1851, *p.* 4.)

Traumatic.—In a case under Mr. Cock, that gentleman pursued the tonic plan of treatment. Three grains of disulphate of quina were given every fourth hour, and twelve ounces of wine allowed per day. Recovery gradually took place. (Mr. E. Cock, p. 68.)

In the Hôtel Dieu of Marseilles, a case of tetanus from wound of the toes was arrested by large doses of disulphate of quinine, maximum forty-five grains in one day. The cure was completed in about a fortnight. (M. Coste, p. 70.)

Professor Miller records three successful cases of traumatic tetanus from the use of Indian hemp. (p. 413.)

Toothache.—The most intense toothache connected with decayed teeth is relieved in a moment by the magic touch of the membrana tympani with a blunt probe. Agonising neuralgia of the face is relieved in the same way. These effects are supposed to be obtained by the influence of the chorda tympani nerve. (M. Desterne, *Lancet, June 7*, 1851, *p.* 626.)

AFFECTIONS OF THE CIRCULATORY ORGANS.

Cardiac Inflammation.—If exceedingly sudden and formidable, as from rheumatism, bleed from the arm boldly, and follow up with opium and mercury as well as colchicum. If the attack has been foreseen, smaller amounts of blood, locally abstracted, may serve the same purpose. If necessary this may be followed by a blister and belladonna plaster, while mercury and antimony are exhibited with a small amount of opium. Then give colchicum cautiously to convert the uric acid into urea; to accomplish this, it need produce none of its usual physiological effects. Nitrate of potassa and phosphate of soda may also be given, and if acidity is suspected in the lower bowels, magnesia may be given. Irritability or pain is to be subdued by hyoscyamus, digitalis, aconite, or conium. (Dr. Nelson, *Prov. Med. and Surgical Journal, July 9*, 1851, *p.* 365.)

Nævus.—In a case of nævus of the anterior fontanelle, Mr. Erichsen made a puncture about the eighth of an inch above the tumour, and an eyed probe conveying whipcord was pushed across the base of the mass. He then cut down upon its point when it projected below the

tumour, and then drew it across; the transverse threads having been carried through in a similar manner, the knots were tied in the usual way, and the mass firmly and effectually strangulated. The child having been under the influence of chloroform, suffered no pain. The threads and sloughing mass separated in three days, leaving a healthy granulating surface, which speedily cicatrized. (Mr. J. Erichsen, p. 248.)

In another case Mr. Erichsen proceeded rather differently. A long triangular needle was threaded on the middle of a whipcord about three yards in length, one half of this was stained black with ink, and the other half was left uncoloured. The needle was now entered through a fold of the sound skin, about a quarter of an inch from one end of the tumour and transversely to the axis of the same. It is then carried through until a double tail nine inches in length was left hanging from the point at which it entered, it was next carried across the base of the tumour, entering and passing out beyond its natural limits, so as to leave a series of double loops at least nine inches in length on each side. Every one of these loops should be made about three quarters of an inch apart including that space of the tumour, and the last loop should be brought out through a fold of healthy integuments beyond the tumour. In this way we have a series of double loops one white and the other black, on each side. All the white loops should now be cut up on one side, and the black loops on the other, leaving hanging ends of thread of corresponding colours. The ordinary double ligature, or quadruple thread as used and figured by the Mr. Liston, always includes a circular mass, and hence is not applicable to those growths that are much elongated or irregular in shape. (Mr. J. Erichsen, p. 248.)

Cellulo-Venous.—In this case a crucial incision was made through the integuments covering the tumour, and reflecting these to its base, a large mass was exposed apparently composed of much dilated and tortuous veins and cellular tissue, with a few cysts containing brownish fluid. Nævus needles were pushed across the base of this, and it was strangulated with strong whipcord. (Mr. J. Erichsen, p. 249.)

AFFECTIONS OF THE RESPIRATORY ORGANS.

Asthma.—*Thymic.*—Apply leeches occasionally on the upper part of the chest, and iodine externally and internally; pay strict attention to every source of irritation with a view to its immediate removal, causing the child to lie with its head well raised during sleep. Select light food and a healthy atmosphere. *Diagnosis:*—Dr. Copland says male children are chiefly liable to it; pale, white, soft countenance; permanent fulness about the upper part of the sternum, extending upwards nearly to the thyroidal region; an almost constant fulness of of the veins of the neck, particularly after any effort, dulness on percussion over that part of the sternum. Signs of congestion of the lungs, and from an early period, difficulty of swallowing; the crowing

sound is either entirely absent or only partial, the pulse is weak and intermittent, and there are copious perspirations over the head. (Dr. J. Armstrong, p. 102.)

Cod-Liver Oil.—Combine liq. potassæ with the cod-liver oil, especially in the early stage of phthisis. Where cod-liver oil cannot be administered internally, it may be rubbed into the chest, night and morning, combined with a little oil of lavender. If diarrhœa be produced, one ounce and a half of cod-liver oil, four drops of creosote, two drachms of compound tragacanth powder, and four and a half drachms of aniseed water, form a suitable mixture, of which an ounce may be taken thrice daily. If vomiting is produced, the addition of creosote often makes the stomach more tolerant of the remedy. The taste of the oil may be covered by eating dried orange peel, or by introducing a little dinner salt into the mouth before or after taking the oil. (Dr. T. Thompson, p. 88.)

Expectoration *as a Means of Diagnosis.*—If a person with some severe chest complaint coughs frequently, and expectorates only frothy, salivary-looking fluid, we suspect pleurisy; if a glairy fluid like the white of egg, we suspect bronchitis; if it has a rusty tinge, and resembles gum water coloured with blood, we are likely to find pneumonia. If there is a sudden gush of pus in considerable quantity, we expect to find that matter has accumulated in the cavity of the pleura has found its way into the bronchial tubes. In consumption the expectoration assumes four characters: 1st. salivary or frothy; 2nd. mucous; 3rd. flocculent; 4th. purulent or porraceous. The 1st may proceed from irritation or slight tubercular deposit. The 2nd may proceed from a more confirmed affection of the bronchial tubes. The 3rd is peculiarly characteristic of secretion from a vomica modified by the absorption of its thinner constituents; and the 4th is indicative of phthisis far advanced, and (if unmixed with froth) usually involving both lungs. The black matter often expectorated is not carbon, as commonly supposed; it is rather a pigment known to be formed under slight or not severe forms of bronchial inflammation. On a little heat being applied to this expectoration, and the microscope used, crystals of apparently triple phosphate may be seen, the proportion of the salts being in an inverse ratio to the degree of inflammation present. The 3rd form of expectoration mentioned above, viz., the flocculent, is stated to be almost a pathognomonic symptom of phthisis. When spat into water it assumes the form of globular masses, like little balls of wool or cotton. Some of these masses have subsided, some are suspended at different depths, others float on the surface, sustained by bubbles of air, entangled in the surrounding mucus. If the process of contraction is going on in a vomica, a diminished quantity of expectoration is a favourable symptom. This is promoted by the use of appropriate regimen, the administration of cod-liver oil, and by the inhalation of turpentine. When the bronchial tubes contribute much to the supply, the skin being moist and the appetite defective, naptha may sometimes be useful, but generally speaking, tannic acid will probably be found a more appropriate remedy. (Dr. T. Thompson, p. 85.)

Hæmoptysis.—Bronchial tubes readily ulcerate; thus expectoration from cavities is promoted. In arresting hemorrhage from the lungs, undue haste should be deprecated. As a general rule, it is better to produce determination to other organs, than to employ direct astringents. Give a dose of calomel, or mercurial pill with henbane, followed by the use of half-drachm doses of sulphate of magnesia with diluted sulphuric acid administered twice a day, or antimony, with nitrate of potash. If the hæmoptysis be passive, alum is the best of the astringents to be used, as the following:—℞. P. gum arabic, p. sacch. alb. āā ʒ iij; p. tragacanth. ʒ iss; alum ʒ ij; g. catechu, ʒ iij; aquæ rosæ, q. s., to form a mass to make sixty lozenges. Gallic acid is not so prompt and effectual as the acetate of lead, but suits some cases remarkably well. (Dr. T. Thompson, p. 83.)

Hooping Cough.—Give Fowler's arsenical solution. Previous to and during its use, bleeding, blisters, and emetics may be employed according to the indications. Children of a year old may take it safely. In catarrh or influenza, it may also be given, in the following form. ℞. Liq. pot. arsentis ʒ j; vini ant. tart., vini ipecac., liq. potas. āā ʒ iiss; aquæ distil. āā ℥ xij., Fiat mistura cujus sumatur ℥ j ter die. (Dr. F. W. Mackenzie, p. 17.)

Laryngitis.—Apply the solution of the nitrate of silver. This may be of two strengths, as occasion may require, ℈ ij. or ʒ j. of the crystallized salt to the ℥ j. of distilled water. The mode is as follows: Two instruments are necessary; a tongue depressor, with a bent handle, and a piece of whalebone, ten inches long, at the end of which must be fastened a piece of the finest sponge, the size of a pistol bullet. Expose the patient seated in a chair, to a strong light, depressing the tongue with the depressor held in the left hand. Holding the probang in the right hand, the sponge having been saturated in the solution, pass it carefully over the upper surface of the instrument, exactly in the medium plane, until it is above or immediately behind the epiglottis. Desire the patient now to inspire, and as he does so drag the tongue slightly forwards with the depressor, and thrust the probang downwards and forwards, by a movement which causes you to elevate the right arm and bring the hand almost in contact with the patient's face. (Professor Bennett, p. 114.)

Phthisis, *Diagnosis of.*—Observe if there is a streak of a vermilion tint, inclining to from on the reflected edge of the gums, most distinct around the lower incisors. The absence of this streak in men affected with inconclusive symptoms of phthisis may incline as to a favourable interpretation of any suspicious indications; but in women rather less weight is to be attributed to this negative sign. The presence of this sign in women, is almost conclusive evidence of the presence of the tubercular element in the blood. Those cases, in which the streak is observed early, or is broad or deep coloured, tend to proceed more rapidly than those in which it is absent or slight, whilst freedom from the streak, even in the third stage, affords encouragement for treatment. (Dr. T. Thompson, p. 85.)

PNEUMONIA.—In an early case, before exudation is poured out, and before dulness as its physical sign is characterised, bleeding will often cut the disease short. But if there is perfect dulness over the lung, increased vocal resonance, and rusty sputum, then exudation blocks up the air-cells, and can only be got rid of by that exudation being transformed into pus, and excreted by the natural passages. (Professor Bennett, p. 101.)

AFFECTIONS OF THE DIGESTIVE ORGANS.

ACETATE OF LEAD.—Never give the acetate of lead but in a fluid form, or without acetic acid being combined with it, and rarely without Battley's liq. opii. sedativ. (Dr. R. Burridge, p. 136.)

CHEEK, *Fistulous Opening in.*—In a case of this kind, a platinum wire, heated by electricity, was passed through the fistulous opening so as produce a slough. This caused little pain, and ultimately produced a cure of the disease. (Mr. J. Marshall, p. 258.)

CHOLERA. *Asiatic.*—Give one grain of acetate of lead every ten minutes. (Mr. W. Sweeting, p. 135.)

DENTAL PULP, *Destruction of.*—For a description of an apparatus for the destruction of the dental pulp by the platinum wire heated by electricity, see pages 255 and 257. (Mr. G. Waite and Mr. T. H. Harding.)

DIABETES.—The benefit derived from the use of cod-liver oil in this disease is often remarkable. (Dr. T. Thompson, p. 128.)

DIARRHŒA.—The advantages in diarrhœa of creosote are that it often succeeds when other astringents fail—it is speedy in its action, and it does not leave the bowels constipated, unless carried too far in its administration. The dose for children from one to two years old, is the one-eighth, one-sixth, or one-fourth of a grain. With adults, the dose, as an astringent, is from one and a half to two minims. (Mr. B. W. Richardson, p. 130.)

DIARRHŒA, *Autumnal.*—Give the citrate of iron and quinine, especially when the affection assumes an intermittent type. (Dr. James Bird, p. 130.)

DYSENTERY.—Give an enema of the acetate of lead in the following form:—Acetate of lead six grains; pure water one oz.; laudanum from thirty to fifty drops: mix for an enema. This should be given and repeated according to the frequency of the discharges, and retained as long as possible. (Dr. J. P. Batchelder, p. 131.)

FISTULA.—To cure fistula without operation, insert into the wound a copper probe of the requisite length, dipped into dilute nitric acid, (one part acid to one of water). The application should be made every day. Copper probes are used on account of the destruction of the silver ones by the strength of the acid. (Mr. H. B. Evans, p. 267.)

Gastralgia.—In cases of true gastralgia, disconnected with any inflammatory complication, use the following formula:—R. Subnitrate of bismuth, ten grammes; extract of belladonna, one gramme; make forty pills: two to be taken night and morning. (Prof. Caizergues, p. 128.)

Hemorrhoids.—If external, and palliative treatment does not avail, excise them. If internal, let a lavement of half a pint of cold spring water be thrown into the rectum every morning after breakfast. As an aperient, use the lenitive electuary, or the bitartrate of potash, at bedtime. If these fail, remove them. A dose of castor oil should be given eight hours before the operation, and a pint of warm water should be thrown up shortly before the surgeon's arrival. It is well to bear in mind that retention of urine is sometimes the result of operations upon internal piles. This must be removed by introducing the catheter. (Mr. T. B. Curling, p. 273.)

Intestinal Obstruction.—In cases of obstruction of the intestines within the abdomen, the following are the indications to pursue:—1st, to open the bowels; 2nd, to subdue inflammatory action; 3rd, to support the strength; 4th, to remove the obstruction. (Mr. R. R. Robinson, p. 259.)

Lead Colic.—Give on the first day five centigrammes of the extract of belladonna, with ten centigrammes of the powder of the root. If this is without effect, the second dose is ten centigrammes of the extract with twenty of the powder. (M. Malherbe, p. 138.)

Portal Obstruction.—When urine contains purpurine, or presents other appearances of portal obstruction, the diuretics, or other remedies employed, should be preceded or accompanied by the administration of mild mercurials, taraxacum, hydrochlorate of ammonia, or other cholitic remedies. (Dr. G. Bird, p. 191.)

Rectum, *Fissure of.*—Give chloroform, and divide the fissure by a longitudinal incision through the centre of the ulcer, including the sphincter muscle. The great source of mischief is now set at rest, and the ulcer heals; but the healing process is promoted by applying a plug of lint, coated with the following application:—Liq. plumb. diacet. ʒj; confect. rosæ ℥j. This plug, dipped in sweet oil, is to be applied to the part. In sensitive ulcers of the rectum, and in painful affections generally, apply the following ointment:—Chloroformyli ʒj. to ʒij; zinci oxydi. ʒss; olei olivæ ʒj; cerat. cetacei ʒiv. M. fe. ung. (Mr. T. B. Curling, p. 272.)

Prolapsus of.—In a case under the cases of Mr. Fergusson, in which the prolapsed part was the size of a man's fist, that gentleman operated by taking up portions of the redundant skin, surrounding it with the volsellum, and cutting off five triangular pieces, with the base towards the anal orifice. The bowel was then returned, the parts well supported, and dressed with wet lint. (Prof. Fergusson, p. 271.)

Ulcer of.—In a case of a small ulcerated fissure of the rectum, such fibres of the sphincter muscle were divided with a sharp-pointed bistoury as prevented the finger being readily introduced. This treatment was followed with success. Another remedy proposed by Dr. James Arnott, is to pass a bougie made of common yellow soap up the rectum from time to time. (Mr. H. Smith, 273.)

Tænia.—Give a drachm of oil of male fern first thing in the morning, followed in an hour afterwards by an ounce of castor oil. (Mr. W. Cowen, p. 138.)

AFFECTIONS OF THE URINARY ORGANS.

Albuminuria.—The presence of pus in the urine may obscure the diagnosis in this disease. The pus corpuscles float in a fluid containing albumen; it thus becomes mixed with the urine and renders it albuminous. A good test for pus is the addition of liq. potassæ, by which it is converted into a mucous fluid, and when poured from a vessel exhibits its glairy character. We must endeavour to obtain the urine free from pus, and if the urine then ceases to be albuminous, it is evident it has no connection with Bright's disease, and vice versa. If, then, albumen exists in the urine independently of pus and blood, and if we have excluded puerperal fever, gestation, and cholera, as possible causes, we may conclude the patient to be subject to one of the forms of Bright's disease. Now, as owing to the drain of albumen, there is an excess of water in the blood, we must endeavour to render the specific gravity as nearly proper as possible. To promote this, experience has decided upon the use of hydrogogue cathartics, vapour baths, and iron. Iron should not be given in the active stages of the disease. As regards the use of iron in anemia generally, we are advised to persevere with its use, notwithstanding the frequent complaints of the patient that it does not agree with him. Abstract then the excess of water from the blood by saline purges, and persevere in introducing iron into the system. (Dr. G. Owen Rees, p. 164.)

Bright's Disease.—Ascertain whether the coagulability of the urine present depends on albumen, by the aid of heat first, and then by the addition of nitric acid. All intercurrent diseases are more unmanageable, and more apt to prove fatal, in consequence of the renal disorder. The most mortal of all signs are, a very scanty urine of very low density, an extremely impoverished condition of the blood corpuscles, and stupor gradually verging towards coma. The treatment of Bright's disease is two-fold; to remove the fundamental disease, and to cure the secondary diseases. The main remedies for the former object are general and topical depletion, local counter-irritation, diaphoretics, diuretics, and astringents. The best diuretics are digitalis, squill, and bitartrate of potash, but when all these have failed diuresis has been established by Hollands. The cathartic plan should not be adopted for the dropsy, it is apt to excite a permanent diarrhœa, and mercury should be shunned as inducing in this disease excessive action.

The best remedy for the diarrhœa is the Edinburgh lead and opium pill, in a dose of five or ten grains, twice or three times a day, to which may be added, in severe cases, a fatty suppository of morphia. Vomiting may be removed sometimes by bismuth, more frequently by morphia, hydrocyanic acid, creasote, chloroform, or little fragments of ice; when these fail, by a blister applied over the epigastrium. (Prof. Christison, p. 173.)

Hæmaturia.—Dr. Rees mentions two forms of hæmaturia; the one produced by calculus in the kidney, and the other by malignant disease. The same remarks made with regard to alkaline urine from irritation of the mucous membranes, may be applied to the presence of a calculus in the kidney. Our object must be to render the urine as unirritating to the mucous membrane as may be, and enable that membrane thus to bear the presence of the calculus with as little inconvenience as possible. To relieve the spasm of the canal, we should combine alkaline and demulcent remedies with such sedatives as the patient can bear without injury to the stomach. The best styptic is perhaps tannic acid; it should be given in the form of pill, at intervals between the doses of iron, in doses of from four to eight grains three times a day. It should not be given in solution, on account of its being rapidly converted in the stomach into gallic acid. (Dr. G. Owen Rees, p. 160.)

Hydrocele.—Mr. Bransby Cooper says that since he has employed injections with the tinctura iodinii composita, he has had no occasion to resort to other means. It has succeeded where other remedies had failed, and he has observed no ill effects accrue from its use. (Mr. B. B. Cooper, p. 311.)

Phosphatic Diathesis.—To remedy that state of the system which gives rise to the excretion of the phosphates, producing secreted alkaline urine, the mineral acids seem to be the most valuable means we possess of restoring the stomach to its healthy function. If we add liquor potassæ to urine in a state of full acid reaction ammonia is immediately evolved. Test paper now used proves the urine to be alkaline, and the disappearance of the blue colour produced on the litmus by exposure, proves it at once to be the volatile alkali ammonia, the fixed alkali being neutralized by the acids with which the ammonia was previously combined. So in inflamed mucous membranes the alkali of the mucus is a fixed one; but this alkali gradually neutralizes the acids combined with the ammonia in the urine, and thus ammoniacal urine is produced. If the fixed alkali is more than sufficient to neutralize the acids of the urine, then the litmus paper becomes permanently blue. We should always ascertain then whether turmeric paper or litmus paper is affected permanently or not. In these considerations we must exclude that form of alkaline urine which is secreted alkaline, and characteristic of dyspepsia. The distinction between the two kinds is, that urine secreted alkaline is very rarely accompanied with more than the normal amount of mucus; while that made alkaline by the action of the mucous membranes always contains an abnormal quantity of mucus and epithelium, and very often pus

also. In the case of alkalinity arising from irritated mucous surfaces, we must direct our treatment to them. In this case, opposite to that of the other, we must exhibit alkalies. The urine as it is secreted must be rendered alkaline, and so less irritating; at the same time attending to the secretions generally, especially to that of the skin. The best means to fulfil the former indication are by exhibiting the salts of vegetable acids as the citrate of soda or potassa, especially when it is not desirable to risk purging the patient; but if we wish to produce such effect, then the tartrate of potassa may be combined or used separately; indeed, for this purpose, there is no better remedy than the seidlitz powder of the shops. The old remedy, liq. potassæ, is likewise one of the most valuable for the purpose of producing an alkaline state of the urine. We are likewise assisted in our endeavours to relieve the irritation of the mucous surfaces by the digestion of all subacid fruits. (Dr. G. Owen Rees, p. 143.)

Dr. Beneke found the phosphates to be present in the urine in very different and nearly all sorts of diseases, varying on different days in one case, and always remaining of nearly the same amount in others; proving that it is not the disease itself which causes the excretion of phosphates, but that there must necessarily exist some other cause in the economy to account for the excretion alluded to. In all cases of rapid emaciation there was a large excretion of the phosphates, and sores of blisters in these cases scarcely healed at all, or not until long after. We may provide persons in this condition with the largest quantities of albumen and fat, but we shall never produce thereby a remarkable increase of tissues or complexion—that is to say, of formation of cells, if we do not diminish at once the excretion of phosphates by the urine. A hypernormal excretion of earthy phosphates by the urine is independent of the nature of the disease. When we observe such an excretion, we find a corresponding deficiency of formation of cells, emaciation, and loss of strength; but this deficiency is not always exclusively caused by a hypernormal loss of phosphates, it is often only the result of fever or suppuration, or of any other loss of material necessary for the regeneration of tissues and organs. It is to be observed we shall never be able to judge of the quantity of the earthy phosphates present in an ounce of urine, unless we examine the whole quantity which is passed during the twenty-four hours. Although albumen and fat are present, the phosphate of lime increases the produce of cells, and in this manner we may promote the cure of diseases showing a deficiency of formation of cells, especially in scrofula. On the other hand, in all wasting diseases, a hypernormal quantity of phosphates is always excreted, especially in those cases where the phosphate of lime proves most beneficial. This quantity, from Dr. Beneke's investigations, is not increased by the administration of the phosphate of lime, but on the contrary, by its use the quantity in the urine often decreases considerably. (Dr. Beneke, p. 406.)

Phosphatic Calculi.—Inject the nitro-saccharate of lead into the bladder for the purpose of decomposing the calculi. This salt may be obtained from Mr. Garden, of Oxford-street. One grain of the salt, superacidu-

lated with five drops of strong acetic acid, is then to be mixed with ℥j. of water, and the whole brought to the boiling point. From four to eight ounces of the solution may be thrown into the bladder at once, by means of a double-current caoutchouc catheter, and renewed in ten or fifteen minutes, as may be deemed proper. Exercise increases its effect. If slight revulsion be produced wait a day or two, and then renew the injection. (Dr. J. Elliott Hoskins, p. 307.)

Spermatorrhœa and Impotence.—Let the patient sit in the hip-bath of Priessnitz for five minutes three times a day, the water being brought to the temperature of 65°. The time may be increased and the temperature lowered, until the patient sits for twenty minutes, three times a day, in water at 50°. In some cases the spine may be sponged for three or four minutes before leaving the bath. A shower-bath may be used after the first daily sitting-bath, the head being protected by a conical cap. (p. 319.)

Stricture of the Urethra.—For some admirable conclusions with regard to strictures in general, and their treatment, by Mr. G. J. Guthrie, see page 289.

The treatment of stricture resolves itself into—1st. Dilatation. 2nd. The application of caustic. 3rd. Division of the stricture, either from within, by the lancetted catheter, or from without, by perineal incision. Dilatation is the simplest and best. As a general rule, the more gently and gradually dilatation is effected, the more permanent will be the relief afforded. In the majority of strictures, and when of long standing, silver catheters, or steel sounds plated, of a proper length and curvature, especially the latter, from their having more solidity than the former, are the best dilating instruments. In cases of retention of urine, where there has been considerable difficulty in introducing the catheter, it should be retained, if practicable, for a period of from twenty-four to forty-eight hours. If dilatation does not succeed in such cases, caustic has been proposed, and successfully employed by many surgeons of high character. Before we apply the potassa fusa, we ought to be able to pass a bougie into the bladder of at least a size larger than the finest kind, to enable us to apply the caustic to the whole surface of the stricture, and likewise to put it in our power to remove a suppression of urine should it occur during the use of the caustic. Caustic potass is superior to nitrate of silver. It may be applied advantageously for two purposes—one to allay irritation, the other to destroy the thickened tissue which forms the obstruction. The bougie should be marked as directed by Mr. Whateley; and if the points of the caustic be covered with lard, there need be no fear of its acting before it reaches the stricture. (Mr. R. Wade, p. 298.)

Mr. Milton recommends a new plan to caustic bougies. The part of the bougie where the caustic is to be placed is first made flat, then a little rough. The caustic is then fused on a sixpence, and the rough spot on the bougie dipped in it, when it is instantly and smoothly coated with caustic. It is then dipped in tallow, and twirled round

until this sets, so that over the caustic there is a smooth sheath of fat. (Mr. J. L. Milton, p. 297.)

Twisted bougies have been recommended in stricture of the urethra, as being better adapted to follow the sinuosities of the stricture, than the plain ones. (M. Leroy d'Etioles, p. 304.)

URINE, *Serum of the Blood in.*—One means to detect the presence of the other constituents of the blood without albumen in the urine is, by adding the tincture of galls, which precipitates one of the extractive matters. The extractives of the urine possess this property in only a slight degree. In albuminous urine the albumen may be first separated, and the test then applied. Dr. Rees arrived at the following results:—That albumen was always accompanied by a large proportion of the extractives of the blood; that these cases were generally marked by debility; that the extractives of the blood were excreted in the urine in cases of anasarca with disease of the heart, unconnected with albuminuria; that cases of chlorotic anemia and hysteria give copious precipitates; that deficiency of albumen was accompanied by deficiency of blood extractives; and that the proportion of the blood extractives diminished by the use of ferruginous tonics. It is to be remembered, that the urine of those in almost perfect health often show traces of the presence of the extractives of the blood; and that the precipitate above mentioned is that which *immediately* follows the addition of the tincture of galls, as in a short time a considerable precipitate of the salts is thrown down. (Dr. G. Owen Rees, p. 168.)

VARICOCELE.—In one case Mr. Fergusson passed three needles under the scrotal veins, and twisted strong silk round them, as in the hare-lip operation. After a few days the needles were removed, which were very nearly out, and in five days afterwards the sores were rapidly healing, and the patient was soon discharged cured. (Prof. Fergusson, p. 310.)

AFFECTIONS OF THE SKIN, &c.

CICATRIZATION.—M. Grusell has lately intimated to the French Academy of Sciences, that charpie suspended in a decoction of oak bark for some days and then dried, forms an admirable dressing after the excision of cancerous tumours, as it preserves the simple condition of the wound, and obtains rapid cicatrization. (*London Journal of Med., July*, 1851, *p.* 669.)

EFFLORESCENCE *of the Face.*—In cases of red spots, or efflorescence of the face, wash them in a solution of borax, two parts to 15 parts each of orange flower and rose waters. (M. Vanoye, p. 332.)

ERYSIPELAS.—In the common forms of erysipelas, give fifteen drops of the muriated tincture of iron, every three hours. It may be especially given in cases of infantile erysipelas, in doses of two drops, as well as in that form of erysipelas dependent upon internal injury. From

the analogous nature of puerperal fever to erysipelas, many valuable lives might be preserved, in the opinion of the author, by its bold and persevering use, (Mr. G. Hamilton Bell, p. 324.)

Iodide of Potassium.—The iodide of potassium was shown by the late Dr. Robert Williams to be of great certainty in rupia and hard periosteal node; that its power is much less in roseola, purpura, and ecthyma, but still it is better than mercury; while, in lichen, lepra, psoriasis, and iritis, mercury is more beneficial than the iodide. If suppuration has commenced in the node, then sarsaparilla is the remedy, the iodide being useless. In soft node and prurigo, he shewed the true power of sarsaparilla; and in syphilitic angina and rupia, the invariable good effects of combining local mercurial applications with the internal administration of the iodide of potassium. (p. 345.)

Lepra Vulgaris.—The common galium aparine seems to be a valuable remedy for this disease. It is commonly known by the name of cleavers or goose-grass, and grows abundantly in the hedges of this country. A decoction of the plant may be made by boiling a large handful of the plant in a quart of water for about twenty minutes. Of this decoction three parts may be taken daily. (Dr. J. M. Winn, p. 333.)

Lupus.—Apply the bi-ioduret of mercury, incorporated with ointment, or suspended in oil. Only a smooth space should be done at once, as it requires reapplying for five or six days. In three or four days the application forms a crust with the exudation it occasions, and on falling off displays a smooth cicatrix. (M. Cazenave, p. 333.)

Psoriasis, *Chronic.*—In squamous diseases of the skin, M. Cazenave prescribes ten parts of ammonia to 250 of simple syrup, the patient taking from six to twenty-four grains of the salt daily. (p. 333.)

Sycosis.—Amongst the most useful applications are the citrine ointment, the iodide of sulphur, and the tar ointment. At the same time give Fowler's solution. (Mr. E. Wilson, p. 331.)

AFFECTIONS OF THE BONES AND JOINTS. &c.

Ankle-Joint, *Amputation at the.*—One reason, Mr. Fergusson says, why surgeons refuse to perform amputation at the ankle-joint is, that the integuments are often swollen and ulcerated. But this is no objection to the proceeding, the disease being produced entirely by, and kept up by, the irritation of the carious bone, a principle of the greatest importance to be remembered. Sloughing of the lower flap has been often observed, and in order to obviate this, Mr. Syme has recommended a shorter flap to be made; and Mr. Fergusson states that he has even made a shorter one than that recommended by that gentleman. It is desirable to make the flap no longer than is absolutely necessary. (Professor Fergusson, p. 231.)

Bursæ Mucosæ, *Deep Vaginal.*—In the treatment of tumours of these synovial sacs, the plans recommended for their cure have been extirpation; incision, either simple or combined with irritation of the surface of the cyst; subcutaneous puncture; and iodine injections. Mr. Coulson has generally contented himself with incising the tumour longitudinally, and evacuating the contents. Some amount of inflammation ensues, with obliteration of the cavity, but sometimes the inflammation proves very severe, inducing great constitutional disturbance, and in some cases even death has ensued from the attack. (Mr. W. Coulson, p. 214.)

Elbow-Joint, *Disease of.*—Mr. Gay has treated cases of disease of the joints by making one or two incisions right down to the diseased joint, with a view of letting out the debris of the diseased articulation, the remnants of cartilages, &c., which seem to him one of the principal obstacles to the procuring of anchylosis. (Mr. J. Gay, p. 212.)

Hip-Joint, *Hysterical Affections of.*—The vegetable tonics seem to be more efficacious than the metallic. But when the appetite is tolerably good, the tongue clean, the bowels regular, then the metallic tonics may be employed with good effect. In most neuralgic affections the preparations of iron are valuable, none more so than the carbonate. To relieve pain no remedy is preferable to valerian. Dr. Copland says the remedy he has found most useful is the spirit of turpentine, prescribed in various modes, internally and externally, and administered in enemata; the preparations of iodine alone, or with narcotics and camphor. (Mr. W. Coulson, p. 207.)

Knee-Joint, *Internal Derangement of.*—Place the patient upon a sofa on the opposite side to the affected knee, then take hold of the ankle with the right hand, and by slow and gentle means, gradually flex the limb. And then when the patient is off his guard, suddenly and powerfully perform the full flexion of the limb. When the full flexion is accomplished, the cure is usually complete. If this does not succeed, place the arm under the popliteal space to act as a fulcrum, to separate, as far as may be, the head of the tibia from the condyles of the femur, and at the same time produce rotation of the tibia. In all cases of contraction of muscles, place the origins and insertions of the muscles as far apart as possible. The masseter muscle sometimes becomes contracted, and may be relieved by the gentle insertion of a wedge into the cheek. (Mr. S. Smith, p. 199.)

VENEREAL AFFECTIONS.

Balanitis, *or Gonorrhœa Preputialis.*—In the uncomplicated disease wash the parts dry, then carefully, and by means of dry lint, accurately placed between the glans and prepuce, separate the two surfaces. If the parts are slightly inflamed, whiten the parts by simply passing a stick of caustic over them. The parts should then be washed

daily with a lotion of zinc and tannin, one grain of each to the ounce, then dried, and lint applied as before. If phimosis be present and be irremediable, the operation of circumcision must be performed. Mr. Acton describes his method of performing the operation at page 347. (Mr. W. Acton.)

Blennorrhagia *of the Vulva.*—Enforce cleanliness. A soothing plan should be first employed, and separation of the surfaces attempted; then lotions of nitrate of silver, ʒj. to ℥ij. of distilled water, with the addition of warm baths. If the inflammation has gained the deeper structures, leeches may be employed in addition, to the groins; and if abscess should form, it must be opened immediately, though we should pause when the inflamation occurs round an already formed cyst. (Mr. W. Acton, *London Journal of Medicine, July,* 1851, *p.* 651.)

Bubo.—Give one grain doses of tartar emetic every second hour, until a marked effect is produced upon the inflammatory swelling. (Mr. J. L. Milton, p. 346.)

Chancre.—If caustic is applied soon after the receipt of the virus it may be entirely destroyed, as within three days the disease is entirely local. Before employing the nitrate of silver, the part should be carefully cleansed, by soaking it in warm water, so as to wash off the virus from the surrounding parts, lest a re-inoculation should take place. The parts are then to be dried, and if any slight fissures or excoriations are found, the parts may be stretched, and a stick of the caustic just passed over them, so as to whiten them. If they are at the orifice of the prepuce, the prepuce should be drawn gently back, and then the part cauterized; and in the next application, if necessary, care must be taken not to break the previous cicatrix. To aid the caustic, a tannin lotion may be used, two grains to ʒj. of water; but as this lotion slightly stains the linen with a brown mark, which may tell tales to the family, a sulphate of zinc lotion may sometimes be used. As a rule, the sore may be re-cauterized in twenty-four hours. If a pustule has formed, nitrate of silver is not strong enough. The pus must be evacuated, and then a layer of Vienna paste inserted, or the solid lime and caustic potash laid on. If a scab has formed, it must be removed by a poultice, and then the Vienna paste applied, extending a little beyond the edges. The sore, after the eschar falls off, is not specific, and heals in a few days under a mild astringent wash. We must bear in mind that when there is acute inflammation around the chancre, escharotics must not be used. (Mr. W. Acton, p. 339.)

Phagedænic Chancre.—Give iron. Mr. Acton trusts chiefly in the tartrate, though probably any other form would do as well. If there is sloughing phagedæna, give opium in large doses. Destroying the surface of the ulcer with nitric acid is useful in some cases. (Mr. W. Acton, p. 342.)

Chordee.—To relieve this condition no remedy is so efficacious as camphor. It may be given in the form of the spirit of camphor, in doses

of ʒj, in a small quantity of water. The best plan is for a teaspoonful to be taken at bedtime; and every time the patient awakes with the chordee, let him arise at once and repeat the dose. (Mr. J. L. Milton, p. 348.)

Gleet.—A blister applied to the penis will often cure the more prolonged gleet. Two blisters and mild injections have cured a clap which had resisted the most energetic treatment. If uncomplicated, it should be applied from the root to within half an inch of the mouth of the urethra; in milder cases one hour and a half. If there are any vesicated spots they must be covered with pieces of linen spread with zinc ointment. Brown's blistering tissue is preferable to the common blistering plaster. In severer cases a longer application is necessary. To protect the penis from friction, a T bandage must be applied, with a bag to receive the penis, and thus to keep it up against the abdomen if necessary. In common cases, a soda and jalap powder may be taken twice a day, and a zinc injection used, ʒj. to Oj. (Mr. J. L. Milton, p. 350.)

Examine the passage by a wax bougie, No. 6 or 8. If an irritable surface is detected, use the strong caustic injection, and give copaiba or cubebs; following up by injections of zinc and tannic acid. If incipient stricture be detected, the nitrate of silver is not advisable; but bougies should be passed every other day, astringent injections being used in the intervals. (Mr. W. Acton, p. 346.)

Gonorrhœa.—In the early stages of gonorrhœa, before the acute symptoms have passed, after the patient has made water, inject into the urethra a solution of nitrate of silver, ten grains to the ounce, and keep it in contact with the mucous membrane a few seconds. The patient must then sit down for ten minutes, and withstand the desire of making water, which, for a short time, is very violent. The effects as to the discharge are generally almost immediate, and the redness produced on the urethra commonly disappears in a few days. A suspensory bandage is then applied under the testes, and rest and abstinence from any fluid enforced for a few hours, so as to give the urethra a little repose. Sometimes a second or even third injection is required; but commonly a cure is effected in a few days. This treatment should only be adopted in the earliest stage. (Mr. W. Acton, p. 334.)

Ricord frequently prescribes the following as an injection to be used two or three times daily; and it is obviously applicable as a lotion to other cases. Take of tannin and sulphate of zinc, each one gramme; rose water two hundred grammes. If the sulphate of zinc be perfectly pure, the solution will be colourless; but if (as is generally the case) it contain some oxide of iron, it will be of a deep red hue, from the formation of a tannate of the oxide of iron, which, being a good astringent, does not injure the lotion. (*London Journal of Medicine, August*, 1851, *p.* 750.)

Use an injection of the solution of diacetate of lead, ʒij. to six ounces of distilled water. Another is a solution of alum, four grains

to the ounce. Another an infusion of green tea, a drachm to half a pint. By ringing the changes on these, perhaps, all the good effects of injections may be obtained. (Mr. Johnson, p. 334.)

Non-Specific Affections.—These, which consists of *warts, vegetations, herpes preputialis, eczema, and excoriations,* may be treated with strong acetic acid. Mr. Acton recommends the powder of oxide of zinc in the more simple forms, and in the obstinate a powder composed of equal parts of ærugo and pulvis sabinæ. (Mr. W. Acton, *London Journal of Medicine, July,* 1851, *p.* 653.)

Syphilis.—Mr. Acton gives an admirable description of chancre at page 338. Concerning the original production of the syphilitic poison, Mr. Acton is of opinion that it arose from some poison introduced into the economy from animals, and that thus produced, it has been transmitted from one individual to another. (Mr. W. Acton, p. 333.)

If a strong alcoholic solution of soap, having an excess of alkali, be applied to a sore, within five minutes after the inoculation with the poison of chancre, the effects of the virus will entirely disappear. (Dr. Langlebert, p. 337.)

Syphilitic Cutaneous Eruptions.—In the treatment of these eruptions, which may come on as exanthematous affections, vesicular, papular, tubercular, pustular, and as ulcerations, Mr. Acton strongly recommends mercurial fumigations. He fully describes his method at page 344. He does not believe the condylomata to be inoculable. As local treatment he recommends the parts to be washed with a solution of chloride of soda twice a day, the parts to be well dried, and calomel sprinkled upon them, and dry lint kept between the excoriated surfaces. (Mr. W. Acton, p. 343.)

AFFECTIONS OF THE EYE AND EAR.

Deafness.—For a description of the cure of cases of deafness, by the employment of vibratory or musical sounds, by Dr. Turnbull, see page 323.

Epiphora.—Slit up the lachrymal canal from the punctum on the conjunctival aspect, so as to carry backwards the orifice at which the tears are received on to the mucous membrane near the caruncle. In cases of obstruction from injury, the sac may be slit up for some way so as to receive the tears at a new opening. (Mr. W. Bowman, p. 322.)

Iris, *Hernia of.*—A solution of five grains of atrophine in an ounce of distilled water was applied to the prolapsed iris of the injured eye, but with little result; but by applying it to both eyes the method succeeded at once. (Mr. Morehouse, p. 322.)

MIDWIFERY, AND THE DISEASES OF WOMEN.

Amenorrhœa.—In a stubborn case where the catamenia had never appeared, with constant severe uterine and lumbar pains, the key-tsi-sing was given, and after thirteen doses the discharge was ample, first of a brown sandy colour, afterwards a free florid healthy discharge. (Dr. John Cocker, *Med. Times, July 5,* 1851 *p.* 22.)

In anemia, depending on amenorrhœa, the general characters of the blood are very similar to those met with in cases of anemia arising from other causes. Loss of blood from any cause appears to lead to the same morbid condition of that fluid as the defective secretion or elimination of certain principles which ought to be separated from it. This latter condition is always fulfilled in amenorrhœa, which disease is by far the most frequent cause of anemia in girls about the age of twenty; and it appears the more remarkable, when the great similarity of composition of ordinary blood and of the menstrual secretion is taken into consideration. So that the same alteration in the constituents of the blood may be brought about by loss of blood, as in menorrhagia, or by the opposite condition of amenorrhœa, or suppressed menstruation. In these cases, the amount of water is usually much increased, and the quantity of solid matter proportionately diminished. (Mr. H. Smith and Mr. L. S. Beale, *Medical Times, June 7,* 1851, *p.* 619.)

Chlorotic Amenorrhœa.—Employ the galvanic cataplasms of Professor Recamier, which may be obtained of Mr. Joseau of the Haymarket, or of Mr. Buckler, 86, New Bond Street, Oxford Street, at the cost of 15s. They are described as follows:—"Each of these cataplasms, or disks, if a scientific term be preferred, is a galvanic pile composed of twelve couples. The couple is formed by a ribbon of zinc and copper, and each couple is separated by a piece of flannel. On the coloured side is cotton wool; on the other, a piece of gutta percha tissue to insulate the apparatus. The only difference between the two disks is, that, in the pink one, the copper stands first, while the zinc comes first in the one covered with blue. The electrical force generated in the apparatus is sent through the copper rings, to which the insulated copper wire can be attached when the more energetic effect of the two cataplasms is required. In some people the acid perspiration of the skin is sufficient to increase the intensity of the electric action; but more active effects are produced by wetting the flannels with diluted vinegar, or a weak solution of common salt, as is seen by the action of the apparatus on the electrometer. When one of these cataplasms is tightly bound to the surface of the skin, it gives an unusual sensation of warmth,—a pricking sensation is felt, and the skin is made red; and, when two of the cataplasms are connected by the wire, and applied to the same surface, but at some distance from one another. A stronger effect is produced when one is applied to the organ we wish to influence, and another to the opposite portion of the spine. Such are the modes of

application; and it may be worn day and night without inconvenience, though, in ordinary cases, it is only under application at night." (Dr. Tilt, *Med. Gazette, June* 13, 1851, *p.* 1044.)

Chlorosis.—In those tedious cases where a girl eats hearty, takes plenty of sleep and exercise, has nothing on her mind, yet still deriving but little benefit from good food and judicious treatment, Professor Recamier recommends his galvanic poultices; one of the disks being applied to the epigastric region, the other to the spine. See "*Chlorotic Amenorrhœa.*" (Dr. Tilt, *Med. Gazette, June* 13, 1851, *p.* 1044.)

Indian Hemp, *as an Oxytocic.*—This seems to be a valuable oxytocic remedy. Several cases are given by Dr. Christison illustrative of its powerful effects. The extract may be given in the form of pill, but in this form the hemp is rather uncertain. Another form recommended is the emulsion, made by rubbing a scruple of the extract in a warm mortar in a drachm of olive oil, to which may be added half an ounce of mucilage, and seven and a half ounces of distilled water. The tincture is perhaps the best form, of the strength of three grains of the extract to a drachm of rectified spirit. The dose of the extract is from one to six grains, of the tincture ten to thirty drops. To promote uterine contraction, less than thirty drops is of little service. In tetanus one or two drachms must be given. (Dr. Alexander Christison, p. 418.)

Inversion *of the Uterus.*—Drs. Denman, Burns, and Merriman advise the uterus with the attached placenta to be returned; but the latter mentions an instance in which he first detached the placenta, and the patient did well. (Dr. Merriman, p. 359.)

Menstruation, *Cessation of.*—To those who are advanced in years, the following may be given at bed time:—Guaiacum resin, cream of tartar, each half a drachm; or, Dr. Paris' form for the 'Chelsea Pensioner:'—Guaiacum resin, ʒj.; powdered rhubarb, ʒij.; cream of tartar and flowers of sulphur, each ℥j.; one nutmeg finely powdered, and the whole made into an electuary with one pound of clarified honey. A large spoonful to be taken at night. (Dr. E. J. Tilt, p. 386.)

Premature Labour, *Induction of.*—Dr. Simpson recommends the dilatation of the os uteri by sponge tents, gradually increasing them in size. The membranes are also separated to a certain extent. This he had never found to fail, although he had employed it in numerous cases. In this manner the first stage of the labour is almost entirely accomplished before labour begins, and consequently, the child is saved from the pressure, &c., incidental to the earlier and protracted part of the first stage. (Professor Simpson, *Monthly Journal of Med. Science, July,* 1851, *p.* 88.)

Puerperal Fever.—Any fluid matter in a state of putrefaction, communicated by linen, a sponge, small particles of placenta, or by the ambient atmosphere, may induce puerperal fever. To remove such

matter from the hands, wash them in a solution of chloride of lime. (Dr. Semmelweiss, p. 378.)

Puerperal Insanity.—The most appropriate treatment to adopted is, that which we should employ for anæmia, and as the condition of the blood becomes impaired the cerebral disorder will disappear. (Dr. F. W. Mackenzie, p. 371.)

Sterility.—In those cases which cannot be accounted for by any disease, but which seem to depend on defective ovarian action, apply Professor Recamier's galvanic poultices. See "*Chlorotic Amenorrhœa.*" (Professor Recamier, *Med. Gazette, June* 13, *p.* 1044.)

Tumour, *Sanguineous Pelvic.*—This form is met with between the uterus and rectum, displacing the uterus frequently, so that the fundus may be felt above the pubes. The treatment is to evacuate the liquid by means of a large trocar; afterwards enlarging the opening by means of a lithotome, and removing any clots which may be in a state of commencing putrefaction. (M. Nelaton, p. 386.)

Polypus Uteri.—For a new instrument for the purpose of removing uterine polypi by the combined influence of pressure and caustic, invented by Dr. O'Grady, see page 390.

Uterine Hemorrhage.—In a most dangerous case of this nature, five grains of acetate of lead were given every hour for forty-eight hours. As the hemorrhage returned on the suspension of the medicine, the same dose was given every four hours, and continued for a fortnight with complete recovery; the patient having taken in sixteen consecutive days 576 grains. (Mr. W. Sweeting, p. 135.)

Indian hemp is exceedingly valuable in restraining uterine hemorrhage. The tincture of the hemp is the most efficacious preparation; it may be given in doses of five to fifteen or twenty minims three times a day in water. (Dr. Christison, p. 413.)

MISCELLANEA.

Anæsthetic, *New.*—This agent which Dr. Snow has been recently using with great success, and which he believes had not been administered before, is the chloruretted hydrochloric ether. "The substance is called by its discover, M. V. Regnault, *l'éther hydrochlorique monochloruré.* It is the first of a series of five bodies which he formed by decomposing muriatic ether by means of chlorine gas in the sunshine. A liquid which is a mixture of these bodies, has been used for some months in Paris by M. Aran, a very zealous experimentalist, as a local application to relieve and prevent pain. Dr. Snow having procured a quantity of this through the kindness of Mr. Morson, chemist, of London, separated the first and more volatile of the liquids by distillation, and he thinks that it possesses some advantages over chloroform." (*Lancet, June* 28, 1851, *p.* 698.)

APERIENT, *Mild.*—The employment of the cortex of the rhamnus frangula, or alder buckthorn, has been recommended by Dr. Gumprecht, of Hamburgh, as a valuable and cheap substitute for some of the aperients now in use. "The fresh cortex is not to be used, as being uncertain or violent in its effects, that which has been kept at least a year being preferable. If given in infusion it sometimes causes vomiting, and the decoction has been found the best and simplest way of preparing it, although the tincture and watery extract are very efficient preparations. The decoction may be prepared with ℥ss to ℥i. of the cortex to ℥xii. of water, boiled down to ℥vj., the strength depending upon the condition of the patient, duration of the disease, &c. So, too, the dose of a tablespoonful may be given every two or three hours, or two or three times a day, according to the state of the bowels and system in general. (*Med. Times, Nov.* 1, 1851, *p.* 469.)

BITE *from an Adder.*—In a case in the General Hospital, Birmingham, the parts were excised, and the surface cauterised by a strong solution of ammonia. Dry cupping was afterwards resorted to, and the parts well smeared with olive oil. The pain and swelling still continuing, he was ordered sesquicarbonate of ammonia ʒiss; decoction of cinchona, ℥viij., ℥j. every half hour. A tablespoonful of brandy to be taken every ten minutes; a mustard cataplasm was applied to the abdomen, followed by fomentations of camomile and poppies. The patient recovered. (*Lancet, Aug.* 16, 1851, *p.* 137.)

GREASE *in Man, Inoculation of.*—In a case in Guy's Hospital, three grains of quinine were ordered three times a day; also a lotion of nitrate of silver, ʒss. to ℥j. of distilled water, applied by a sponge pushed up the nostrils; with full diet, ten ounces of port wine, and two pints of porter daily. The solution of caustic seemed decidedly to have killed the disease. The parts around the nose, cheeks, and eyes, were much swollen, and were punctured. The streams and jets which flowed from the wounds showed the state of congestion the parts were in. (Mr. Cock, *Lancet, Aug.* 9, 1851, *p.* 179.)

MEDICINES, *to Disguise the Taste of.*—We should prepare the mouth before, instead of after swallowing nauseous medicines, in order that their taste may not be perceived; aromatic substances chewed just before, as orange or lemon peel, &c., effectually prevent castor oil being tasted. (Dr. Polli, *Med. Times, Aug*, 5, 1851, *p.* 160.)

TANNIN, *Employment of.*—Dr. Cummings states, as the result of several year's experience, that he has found tannin the most valuable of *astringents.* Thus, whenever, in dysentery, medicines of this class are indicated, it acts admirably, either given alone or combined with opium. He says, he could refer to more than a thousand cases of dysentery, diarrhœa, cholera infantum, &c., in which he has employed it, never with regret, and almost always with advantage; while other practitioners, with whom he has communicated concerning it, express similar opinions. In the sweating, or last stage of phthisis, or low continued typhus, and even in the worst cases, this accompaniment of

diseases of debility has been entirely or in part relieved. It is useful in almost all forms of hemorrhage, and most remarkably so in hemoptysis; and when combined with opium and ipecac., it forms a medicament very preferable to acetate of lead and other similar substances. Among other forms of hemorrhage, over which it exerts great power, is that from the bowels resulting from dysentery, and that which occurs in threatened abortion. In hemorrhoids, it is of great use as an outward wash. In epistaxis, it may be snuffed up or blown through a quill, and will almost always arrest the bleeding. No article in the whole class of astringents acts like it in severe salivation. In aphthæ and other diseases of the mouth, in which there are spongy or bleeding gums, it possesses no equal. Used as a gargle in relaxed uvula and tonsils, its efficacy is great. As an *antispeptic*, for cleaning old foul ulcers, the author has extensively used it in the form of a powder, especially when there is disposition to hemorrhage. As an astringent collyrium, it is, in his opinion, preferable to all other substances in the purulent ophthalmia of infants. He administers it internally in two-grain doses. (*Boston Med. Journal; and Brit. and For. Medico-Chirurgical Review, Oct.* 1851, *p.* 556.)

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